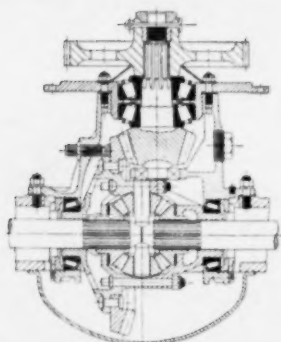


ROADS AND STREETS

HIGHWAYS BRIDGES
AIRFIELDS
HEAVY CONSTRUCTION

MAY 1953



How HEIL COMPANY mounts pinion and differential of its 2C500 Heiliner on Timken tapered roller bearings to insure dependability and long life.



New Heiliner scraper travels 25 mph fully loaded... has 22 TIMKEN® bearings to help

THIS is the latest model 2C500 Heiliner similar to those purchased by the U. S. Army Corps of Engineers in 1952. The unit is equipped with a 13 cubic yard scraper, and features Hydro-Steer, unobstructed visibility, and speeds up to 25 miles per hour—even when loaded!

To insure rugged dependability under the severest kinds of service, Heil uses a total of 22 Timken® bearings in the scraper's vital parts. In the differential, engine shaft and pinion, Timken bearings assure accurate gear meshing, reduce wear. That's because the tapered construction of Timken bearings en-

ables them to take radial and thrust loads in any combination. Shafts are held in positive alignment, a smooth flow of power is insured. Timken bearings are also used in the scraper's wheels, power control unit and hydraulic pump.

Because they keep housings and shafts concentric, Timken bearings make

closures more effective. Lubricant stays in—dirt stays out. To make sure you get top value in the equipment you build or buy, always look for the trademark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN
TRADE MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS



NOT JUST A BALL — NOT JUST A ROLLER — THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST — LOADS OR ANY COMBINATION



Dozens of Uses • Thousands of Users

Prove Ability, Versatility of the Model D

The thousands of satisfied owners are still finding new uses for the able and versatile Allis-Chalmers Model D Grader. It has proved again and again that it has the power and capacity to do outstanding work on both construction and maintenance.

Usefulness of the Model D is multiplied by several easily mounted attachments: hydraulically controlled rear-end loader, shoulder maintainer that is interchangeable with the loader, scarifier, both V-type and blade snowplows.

MORE POWER, MANY FEATURES, LOW COST

For even greater performance ability, the Model D's power has been boosted to 40 brake hp. With its added power and many big-grader features such as tandem drive ROLL-AWAY Moldboard, tubular frame and hydraulic blade lift — the Model D's original cost still is but one-third that of a large grader. Operating costs are low, too.

Your Allis-Chalmers dealer will be glad to demonstrate what the versatile, economical Model D can do for you.

ROLL-AWAY is an Allis-Chalmers trademark.

40 Brake hp. • 8,800 lb. (bare) • Four speeds forward to 25.6 mph., reverse to 3.3 mph.



Handles light construction on streets, roadways, etc.



Backfills ditches, packs and levels ground, loads excess dirt to trucks.



Scarifies, with plenty of down pressure, accurate hydraulic control.



Mixes thoroughly, with rolling action of ROLL-AWAY moldboard.



Cuts and cleans ditches, slopes banks, grades shoulders.



Loads sand, dirt, snow — any material — to trucks.



Finish grades between forms on road and street construction.



Levels for home building, parking lots, play areas, etc.



Terraces, builds diversion ditches, does miscellaneous grader work.



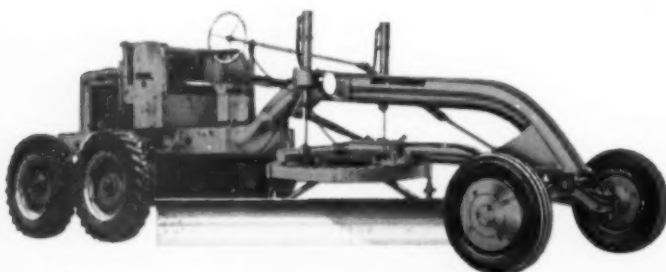
Loads sand, gravel, dirt, any material, with 5-cu.-yd. bucket.



Rough grades, spreads and cleans up on street or road construction.

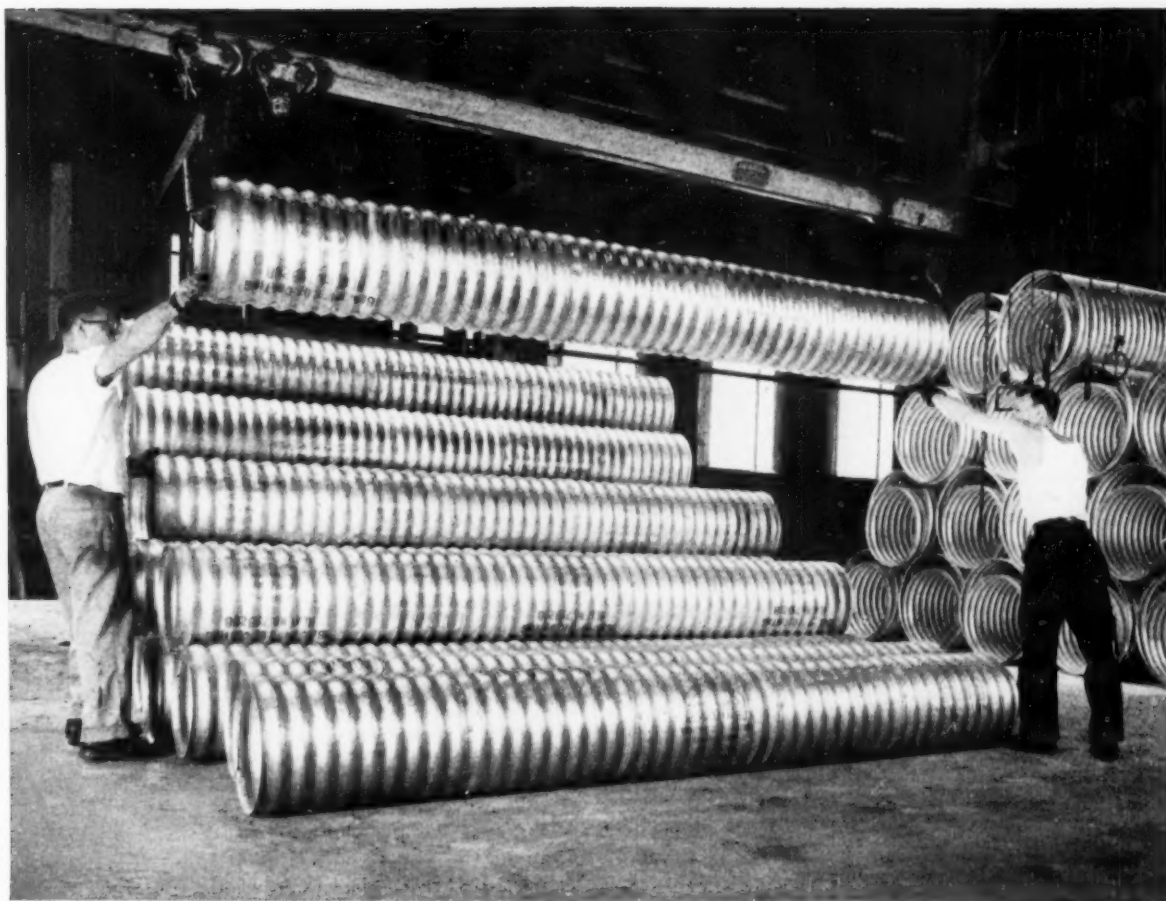


Landscapes, grades lawns, slopes, ditches around housing projects.



- Designed for your jobs
- Built to take it
- Easy to operate
- Easy to service

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TRACTOR DIVISION • MILWAUKEE 1, U. S. A.



How many other culvert materials have all the advantages of galvanized steel?

Almost any culvert-pipe material will have some outstanding features—yet there is no other single culvert-pipe material with all of the advantages found in galvanized copper-bearing sheet steel. It has an excellent balance of physical properties; dependability and low cost.

Culvert pipe made of galvanized sheet steel has flexibility as well as high tensile strength. It withstands impact and vibration of overhead traffic. It conforms to grade and maintains alignment without pulling apart. It absorbs any changing loads that might be caused by shifting or freezing soils.

Galvanized sheet steel culvert pipe is easier to handle and to ship. Because of its thinner walls, it weighs considerably less per foot. It is generally made in longer sections, requiring fewer field joints. It can be unloaded and placed without special lifting equipment.

The heavy zinc coating and the copper content of the steel provide the pipe with a double defense against rust. It has excellent resistance to corrosion and can be expected to give long service.

Bethlehem does not fabricate culvert or drainage pipe, but does manufacture Beth-Cu-Loy, galvanized, corru-

gated steel stock used by fabricators. This stock meets the Federal and the American Association of State Highway Officials' specifications.

Any of our sales offices will gladly give detailed information on Beth-Cu-Loy, and furnish the names of pipe fabricators who use it. Write or phone.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



BETH-CU-LOY GALVANIZED CULVERT SHEETS

When writing advertisers please mention **ROADS AND STREETS**, May, 1953

ROADS AND STREETS

MAY, 1953

VOL. 96

No. 5

Roads and Streets represents 60 years of continuous publishing in the highway field; combined with Engineering & Contracting and Good Roads Magazines, established in 1892

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Publisher



HALBERT P. GILLETTE, Chairman of the
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A magazine devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations, and to the construction and maintenance of airports.

Coming Articles

Getting Heavy Equipment to the Job

An article by a manufacturing leader will analyze the problem of transportability of road-building and construction equipment, and some of the problems and policies involved. (Do you realize that equipment moves often represent \$2,000 to \$3,000 per mile of roadbuilding cost?)

What Causes Equipment Delays on the Job?

This subject is analyzed, together with what to do about it, by an article based on a stop-watch study of many road jobs. Momentary "hitches," such as waits on wagons, etc., are more to fear than bad weather on the average job.

Roadside Mechanization Continues to Advance

First of a series of four articles, with scores of pictures of new machines, will be presented in a series beginning soon. Of interest to contractors as well as highway department men.

Notes on Airfield Paving Methods

Several articles shaping up on current heavy-duty runway extension work for jet planes.

And Also . . .

Use of emulsions for base construction. . . . How a Wisconsin county builds "sand lift" roads with scrapers. . . . This California contractor produces cold and hot mix—big daily yardages of both from a single asphalt plant. . . . Another highway tunnel article. . . . Several articles soon on urban expressways, plus reports on methods seen on the big Eastern Thruway and turnpike projects.

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J. C. Black, Associate Editor
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For Public Service

in behalf of modern highways

We are proud of being awarded the 1952 Silver Anvil Trophy of the American Public Relations Association for meritorious public service in behalf of a modern highway system for America. The "Better Roads" campaign, sponsored by Goodyear in national magazines and newspapers, played an important part in the current nationwide drive for improved highway transportation facilities. It is one more example of the wide range of Goodyear's activities to be of greater service to every user of motor transportation.



"MOTOR TRANSPORTATION IS THE LIFEBLOOD OF AMERICA. THE HIGHWAYS ARE ITS ARTERIES—WE CANNOT LET THEM HARDEN."

P. Mitchell

Chairman of the Board, The Goodyear Tire & Rubber Company, Inc.

(This timely quotation keynoted Goodyear's award-winning "Better Roads" campaign.)

GOOD YEAR

America needs better, safer roads. Let's bring them up to PAR

When writing advertisers please mention **ROADS AND STREETS, May, 1953**

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Loaded with
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Priced to fit
SMALL BUDGETS

"Big Grader" Features

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(Above features are available as "extras")
- Positive 4-wheel tandem drive.
- Hydraulic controls.
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- Front tires 6.00-20, rear tires 7.50-20, larger sizes available.
- Loader, Windrow Eliminator, "V" Snow Plow, and Bulldozer available.

FULL-SIZE CAB

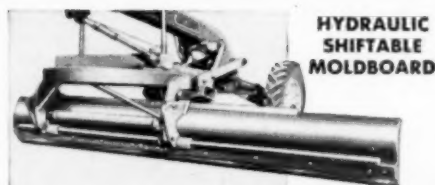
All steel and rubber-mounted safety glass. Full height doors. Top half of cab easily removed. Adjustable windshields.

A WISE and THRIFTY BUY

— for any Contractor, Highway or Street Department. The GALION 503 is compact, rugged, and engineered to do operations usually done with larger and more expensive graders.

Put your road and street maintenance program in high gear with the GALION 503 — and do it without straining the budget! On new construction it will save thousands of dollars in investment and operating costs over the costs with heavier graders.

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A horizontal travel of 30" provides a 45" maximum reach, right or left, outside the front tires.



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Cable address: GALIONIRON, Galion, Ohio

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**BUCYRUS
ERIE**

HYDROCRANE'S built-in reach grabs the *"EXTRA-DOLLAR"* jobs

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1. *On erection work* boom reaches between girders . . . hoists concrete buckets, planking, etc., to upper stories . . . saves hundreds of man-hours.
2. *On road work* telescoping boom reaches under branches, over obstructions while handling pipe, culvert, or levelling shoulders . . . moves material into tunnels and low underpasses . . . handles dozens of close-quarter jobs.
3. *On yard work* reaches into boxcars . . . over fences . . . between stockpiles to move material, load trucks, etc., in a hurry.

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CONVERTIBILITY
TO *HYDROHOE***

By actual stop watch test, crane has been converted to drag-shovel front end by one man in less than one hour! And on trenching, telescoping action of Hydrohoe boom cuts lost time moving up as much as 40 percent.

Get the full story on the all-hydraulic Hydrocrane with its many attachments.
SEND COUPON TODAY



Here the Hydrohoe starts a trench cut. Available with either 12- or 18-inch dipper—equipped with hydraulic ejector that kicks dirt out.

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☐ Please send me Hydrohoe literature.

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3H53

HOW CONTRACTORS* SPEED ON CHIEF JOSEPH

...with **TEXACO**
SIMPLIFIED
LUBRICATION

CHIEF JOSEPH BUILDERS,* a combine of four principal contractors, is doing the construction work for Chief Joseph Dam proper. In addition to a vast amount of heavy construction equipment—bulldozers, scrapers, trucks, shovels, etc.—the project involves tremendous cableways, one of the biggest refrigerating plants in the Northwest, a giant gravel crushing plant, and much more besides.

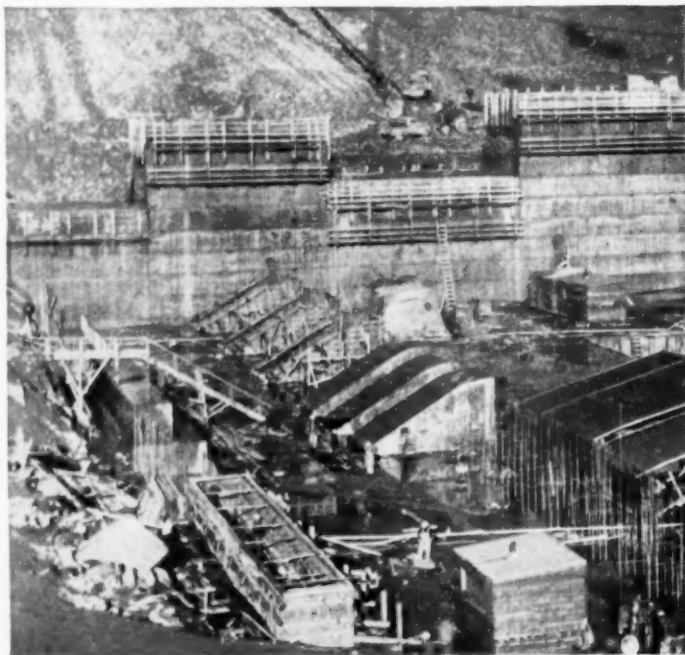
All this equipment and machinery is lubricated exclusively with Texaco. The Texaco Lubrication Engineer servicing this project worked out for the Chief Joseph Builders a Simplified Lubrication Plan—by which all major lubrication is handled with only six Texaco Lubricants.

"The Texaco Simplified Lubrication Plan," says Chief Joseph Builders, "has been a big help to us. By reducing the number of lubricants we have to use, we have substantially reduced the chance of error in application, and have speeded our maintenance work. And, of course, the always-fine quality of Texaco Lubricants has been an important factor in keeping our equipment on the job and our maintenance costs low."

Let a Texaco Lubrication Engineer work out a Texaco Simplified Lubrication Plan for your next project. Just call the nearest of the more than 2,000 Texaco Dis-

tributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.



TUNE IN:
Tuesday nights
on television —
the **TEXACO STAR THEATER**
starring **MILTON BERLE**.
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TEXACO

WORK DAM



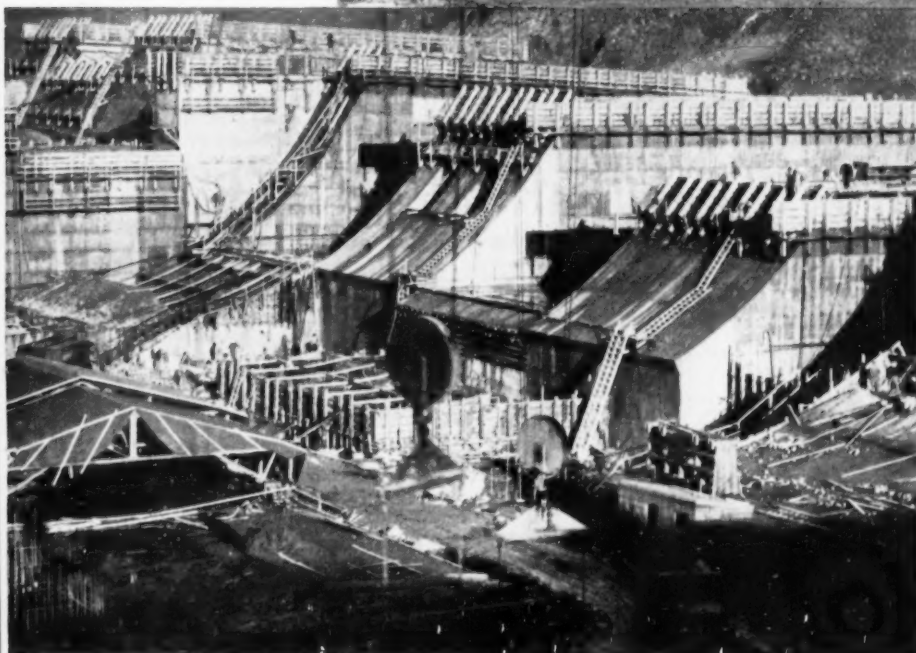
THESE ARE THE CHIEF JOSEPH BUILDERS

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Baltimore, Md.

L. E. Dixon Company,
San Gabriel, Calif.

The Hunkin-Conkey
Construction Company,
Cleveland, Ohio

American Pipe &
Construction Company,
Los Angeles, Calif.



THIS IS only a tiny part of the vast quantity of equipment used on the Chief Joseph Dam project. All of it is lubricated exclusively with Texaco.

CHIEF JOSEPH DAM at Bridgeport, Washington, is just below Grand Coulee Dam on the Columbia River. When completed it will have a power generating capacity second only to Grand Coulee itself. The dam takes its name from the famous Chief Joseph of the Nez Percé Indians. Picture shows cableway placing in stilling basin.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

ONE TOOL Does All of These Jobs

- ON OUR ROADS**
- It scarifies, pulverizes and prepares old asphaltic oil mats, oil macadam and water-bound macadam for 100% re-use.
 - It pulverizes and prepares cemented gravels, caliche, clays and other hard soils for mixing.
 - It aerates prepared and mixed materials to get optimum moisture content.
- ON OUR DAMS AND AIRBASES**
- It blends different types of soil to obtain greater density and better compaction.

A Wood P-600 Preparizer reducing asphaltic oil road to original size of aggregate.



WOOD P-600 PREPARIZER



WOOD Spreader Box

Attached in 30 seconds to a dump truck, the Wood Spreader Box measures and forms materials into accurately proportioned windrows as the truck moves along. Windrow capacities of 2 to 8 cu. ft. are quickly and easily controlled by adjustable tailgate. The Wood Spreader Box eliminates guesswork in measuring imported materials placed on sub-grades or bases.

This is the only tool on the market that will do all of these jobs. It is not a converted piece of agricultural equipment.

State and county highway officials, with an eye on budgets, are reclaiming literally hundreds of miles of old asphaltic oil and macadam mats for 100% re-use with the Wood P-600 Preparizer. Savings are running into thousands of dollars.

Contractors, under constant pressure of time and costs, are using the Wood P-600 Preparizer for soil blending, aerating materials, pulverizing cemented gravel, and for other time-saving, money-saving jobs.

The Wood P-600 Preparizer is becoming **must** equipment in more and more places every day. Find out why. See your Wood distributor or write us direct for literature and prices.

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How Are Natural Rubber Roads Standing Up?

A Progress Report

Since 1949, test roads incorporating natural rubber powder have been laid in 19 states in the U. S. Most of them are in excellent condition today and have required no maintenance. While it is still too early to say conclusively that natural rubber roads are the answer to America's tremendous highway problem, indications are that natural rubber powder added to asphalt can aid materially in stretching our highway dollars, by giving us roads that last longer and require less repair.



West Side Highway, Borough of Manhattan, New York City Laid, summer 1950, a 100' test section of natural rubber-asphalt pavement, with adjacent stretches of other types of rubber paving and a control section without rubber.

RESULTS: After almost three years of traffic, rated at 60,000 vehicles per day, the natural rubber section has withstood the ravages of traffic and climate, and the Borough officials are well pleased with the results.



Route 11, Montreal, Canada

Laid, 1949. Control section (without rubber) was laid twice the thickness of the natural rubber test section. Traffic volume is up to 25,000 vehicles per day, with vehicles using tire chains during most of the winter.

RESULTS: On the control section, chain markings appear to be permanent, and the surface has broken through in several spots. On the natural rubber section, chain indentations, which appear during the winter, are healed over and smoothed out during summer months, leaving no apparent damage to the surface.



Falls Road, Baltimore, Maryland

Laid, 1950, a test section with 1 1/4" binder course and 1" sheet asphalt top course, both containing natural rubber powder.

RESULTS: After nearly three years of main artery traffic, both the natural rubber section and the control section are in first-class condition. The natural rubber section appears darker in color, indicating it has not lost as much of the lighter oil fractions of the asphalt cement through solar radiation.

FREE SPECIFICATIONS AND ASSISTANCE

The facilities of the Natural Rubber Bureau Research Laboratory are available, without cost, to all highway engineers. If you would like to lay a test strip of natural rubber-asphalt paving, we invite you to write us. Our experienced highway engineers will supply you with free information and technical advice.

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"Big Red"

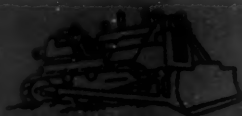
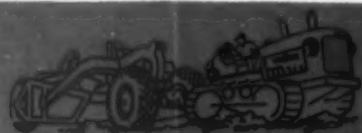
**Contractor completes job
45 days ahead of estimate as
TD-24 fleet moves a million yards**

Ryan Construction Company, Evansville, Indiana, took on a big job when they contracted to move a million cubic yards of dirt and place 35,000 tons of riprap in site preparation for a new steam generator plant on the Ohio River.

From the first day on the contract, Ryan's five TD-24's made the dirt fly. Their assignment: to cut down two hills and dump the excavated material in old creek bed to make a new power plant site.

They averaged 4 minutes and 40 seconds on the 2,000 foot round trip between cut and fill. Self-loading heaped

SWIFT SELF-LOADING A pair of hustling TD-24's charge ahead, self-loading 18 yard scrapers as they go. Five of these fast Internationals helped keep the job ahead of schedule.





Rolls for Ryan

scrapers, the Big Red fleet moved tremendous yardages every day—kept doing it even in rain and mud, the Ryan people report.

TD-24's are the fastest and most powerful crawlers on the market. That's why "Big Red" performance is paying off not only for Ryan but for contractors across the country who need big crawler power to get tough jobs done on time.

And you can't beat the service provided by your nearby International Industrial Distributor. His trained servicemen, complete stocks of parts and up-to-date shop facilities are available to you anywhere, anytime to keep your equipment in production.

He and the famous line of IH crawlers he sells are willing and able to help you put your contract on a paying basis.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.



POWER STEERING WITH FULL LOADS mean faster cycles, higher daily production. Because "Big Red" steers with full power on both tracks, it can maneuver with the same heavy loads that can be pulled on the straightaway.



WATCHING BIG RED ROLL Ryan Construction men keep close tabs on the performance of their five TD-24's. Cycles are clocked for half an hour every morning and afternoon. Left to right: Guy Tilley, Job Superintendent, Tom Vickers, Job Foreman, and Virgil Scales, Superintendent.



INTERNATIONAL

POWER THAT PAYS



USER RATES SCHRAMM AIR COMPRESSOR "TOPS"

After using a Schramm 210-c.f.m. Air Compressor for three years without a single repair to the compressor, a letter from Cyril B. Williams of the Williams Rock Company, Clinton, Mo., reported the purchase of another Schramm 210, saying that, "where plenty of air is needed," he recommended Schramm Compressors, "as I think they are tops!"

Here is shown the job being done by Schramm for Williams — furnishing air for drilling limestone ledge rock 14 ft. to 16 ft. in depth . . . the compressor operating 2 heavy-duty rock drills . . . one man operating both hammers. Result: 400 tons of crushed stone daily which, Williams continued, "means a lot of drilling!"

You, too, will find Schramm Air Compressors "Tops." For complete information on their many advantages, write us today.

SCHRAMM, INC.

The Compressor People

WEST CHESTER • PENNSYLVANIA



NOW! Completely new FORD TRUCKS for '53

Scores of brand-new, TIME-**SAVING** features in the completely new Ford Trucks for '53 add a new dimension to truck economy. And you can choose from over 190 models in a greatly expanded line.

Ford Trucks are leaders in *low first cost* and *low running costs*. They last longer for *low ownership costs*. Now for '53, new TIME-**SAVING** features cut trucking costs still further.

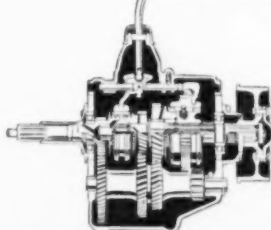


NEW 6 1/2-FT. PICKUP box has new rigid, clamp-tight tailgate.

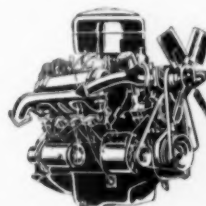


NEW "DRIVERIZED" CABS cut driver fatigue! One-piece curved windshield 55% bigger. I-REST tinted glass (extra cost). Wider seat with counter-shock seat snubber.

Deluxe cab shown in all illustrations



NEW SYNCHRO-SILENT transmissions for easier shifting—no "double clutching"—standard all models. New *Fordomatic* or *Overdrive* on F-100 at extra cost.



NEW LOW-FRICTION POWER in 3 overhead-valve engines—*Cost Clipper Six*, *Cargo King V-8's*. Five engines in all with famous *Truck V-8* and *Big Six*.



NEW SHORT TURNING for better maneuverability. New wider tread gives 37° steering angle. New set-back axles shorten wheelbase, improve weight distribution without reducing capacity.



NEW SPRINGS! NEW BRAKES! Longer front and rear springs for easier ride, longer life! New self-energizing brakes for better control . . . double-cylinder type, rear, on Series 500 and 600.

Parallel frame rails
for better service
accessibility

New banjo-type
hypoid rear axle



New steering geometry
New wider tread, set-back front axle

NEW TIME-SAVING** FEATURES THROUGHOUT!** All new . . . all the way! New fast controls and new power save truck time on the road . . . New service accessibility saves truck time in the shop.



BIGGEST FORD TRUCK ever built—new Ford Series F-900 has G.C.W. rating of 55,000 lbs. as a tractor and G.V.W. truck rating of 27,000 lbs.

Designed for today's hauling needs!

FORD ECONOMY TRUCKS

SAVE TIME! • SAVE MONEY! • LAST LONGER!

Good Drivers Drive Safe Trucks

FREE! MAIL THIS COUPON NOW!

FORD Division of FORD MOTOR COMPANY
P.O. Box 658, Dearborn, Michigan

Please send me without charge or obligation, complete details on new Ford Economy Trucks for '53!

FULL LINE ☐ HEAVY-DUTY MODELS ☐
LIGHT MODELS ☐ BIG JOB MODELS ☐
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HEILINER



J. P. SINNA USES 13-YD. HEILINERS

to move 72,000-yds. of clay and hardpan for a road widening and relocation job in Minnesota. Each unit is moving 1250-yds. per 10-hour day on a 500-ft. average haul. These 13-yd. 2C500 Heiliners are ideal for short haul work where high speed and maneuverability are essential, yet they have all the capacity, speed and power necessary for long haul jobs.

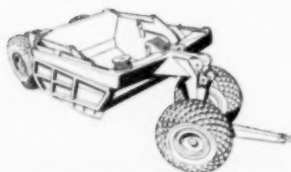
There's sure to be a popular Heiliner, either 13-yd. or 18-yd., on a job near your location. It will pay you to watch their performance on the job, get facts and figures from the men who own and operate them. Your nearest Heil distributor will gladly tell you where you can see Heiliners in action, and explain every feature which makes them first choice with so many contractors like J. P. Sinna.



13 and 18-yd. Heiliner Scrapers



20-yd. Heiliner Bottom Dump Wagon



6, 9, 11 and 16-yd. Tractor Drawn Scrapers



Cable Power Control Units

"The best balanced, easiest loading and lowest maintenance unit ever operated under my supervision during thirty years road experience"

says *J. P. Sinna* president

J. P. SINNA and SON
St. Paul, Minnesota

● WHEN you want the last word on low-cost earthmoving and the kind of scraper performance that trims cycle time to the bone, ask Heiliner owners like J. P. Sinna and Son. They're the boys who know an easy operating, high producing rig when they see one, and after 30 years of building good roads, J. P. Sinna knows to the last ounce what to expect from his equipment. What he expects from his earthmovers he gets from Heiliners . . . the easy loading, fast hauling and easy spreading characteristics that speed the job . . . the well-balanced design and *correctly* applied power which save horsepower and fuel consumption . . . the low maintenance and easy servicing that reduce downtime.

When it comes right down to choosing an earthmover, you choose on the basis of performance, big production and trouble-free operation. Be sure to investigate every advantage of Heiliners before you start your next contract.

BALANCED POWER—BALANCED DESIGN

Skillful, balanced design of both tractor and scraper distributes weight properly and utilizes every possible mechanical advantage to apply maximum drawbar pull to the cutting edge. *Exactly* right power, correctly applied at the point of action, *utilizes* horsepower instead of wasting it. Spinning the drive wheels in the pit doesn't put dirt in the bowl! There's plenty of power in the big diesel engine to meet every job condition efficiently, with ample reserve to handle the toughest jobs.



FAST, EASY LOADING

The bowl of the Heiliner is designed to "boil" up a fountain of dirt in the center of the bowl, quickly heaping both back and front with evenly balanced pay load in a short digging distance. With Heil's planetary drive, the final reduction is in the drive wheels, where it provides a smooth application of lugging power from engine to tire for the greatest utilization of available horsepower. Heiliner's extra-large rim size permits greater ground contact area for better traction and flotation in soft going.



"TILTING FLOOR" FORCED EJECTION

This exclusive Heiliner feature is the simplest, most efficient type of positive forced ejection known. It assures ejection of the entire load with no leftover yardage . . . fast, smooth spreading with minimum horsepower requirements. The floor of the bowl is hinged behind the cutting edge and simply tilts up to a 75° angle by means of a positive ram action. After overcoming the slight initial static friction, the only pressure to be overcome is that exerted by the load on the sides of the bowl. With the ordinary square bowl, more horsepower is needed to overcome the tremendous pressure of tons of heavy dirt on the bottom of the bowl, as well as against the sides.

THE HEIL CO.

DEPT. 453, 3004 WEST MONTANA STREET • MILWAUKEE 1, WISCONSIN

Factories: Milwaukee, Wis. — Killside, N. J.

Sales Offices: New York, Hillside, Washington, D. C., Atlanta, Cleveland, Milwaukee, Detroit, Chicago, Kansas City, Denver, Dallas, Los Angeles, Seattle, Rio de Janeiro, Brazil.

Mobile CONCRETE MIX PLANT

21-FOOT discharge

(HIGHER WITH SPECIAL BOOM)

KOEHRING 16-E *twinbatch*.

with 6 m.p.h. rubber-tired mobility and high elevating boom, has unlimited application on all types of concrete construction work . . . for buildings, retaining walls, pilings, culverts, bridges, tunnels, widening highways and airport strips, batching into trucks, etc. Bucket rides on 60° elevating boom . . . discharges controlled batch into overhead forms, hoppers or chutes at a dumping height of 21 feet (higher with special boom). Boom also swings in an arc of 160° . . . speeds pouring of floors, foundations. This

heavy-duty 16-E easily mixes and distributes up to 50 cu. yds. per hour. 7-second skip hoist, split-second Autocycle mixing controlled by Koehring Batchmeter, and vertical syphon-type water tank, all assure consistent, maximum-strength concrete at top batching speeds.

Productive work-time is increased because mobile, rubber-tired 16-E works over pavement without planking, makes self-powered moves job-to-job at 6 m.p.h. Get more facts from your Koehring distributor, or write for literature.

KOEHRING CO., Milwaukee 16, Wis.

(Subsidiaries: JOHNSON • PARSONS • KWI-MIX)



KOEHRING 16-E *twinbatch*®

PAVERS • FINISHERS • CONSTRUCTION MIXERS • CRANES • EXCAVATORS • DUMPERS • MUD-JACKS

height



CONTROLLED-DISCHARGE BUCKET

has clamshell-type door, hydraulically controlled... can be opened or closed at any time for gradual discharge.

24 cu. ft. water-level capacity is more than ample for the full 16 cu. ft. concrete batch, plus 10% overload.



BOOM SWINGS IN 150° ARC...

... double-channel distributing boom on the Koehring 16-E twinbatch is power controlled... swings in a 160°

arc, elevates 60°... is self-locking and holds securely in any position for accurate spotting and discharge.

SET-UP FOR CENTRAL-MIX

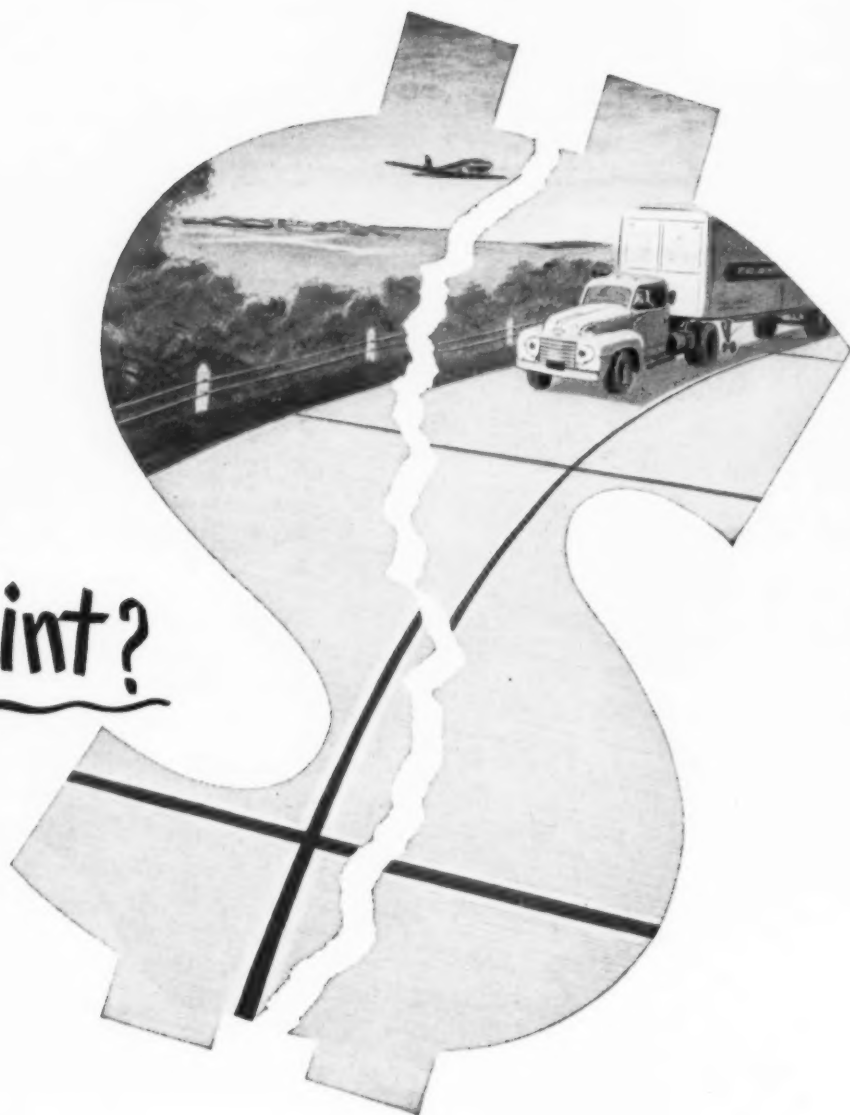
Producing concrete for factory floors and footings on a building construction job (below), a Johnson Lo-Bin[®] Trolley Batcher weighed the materials... Koehring 16-E twinbatch handled all mixing, and discharged concrete into overhead storage hopper... Kwik-Mix 10 cu. ft. Moto-Bug[®] power wheelbarrows hauled and poured the concrete into building forms.



Ask, too, about production advantages of big 34-E twinbatch and Longitudinal Finisher for highway, airport, other major paving jobs.

Are your
maintenance
costs

Out of joint?



Joint-sealing every year costs too much money . . . cuts deep into maintenance budgets. Put *one* application of FLINTSEAL* in your concrete pavement joints . . . and then forget those joints for years!

Unlike the old types of bituminous fillers which crack and leak in cold and flow and smear in heat, rubber-asphalt Flintseal stays put . . . remains extensible and compressible through expansion and contraction of the pavement slabs.

Seals out water—*positively* . . . yet is flexible and resilient . . . bonds to joint walls perfectly!

So don't take chances! Look at savings over the years by using Flintseal. Write for complete data. *Reg. U.S. Pat. Off.

THE FLINTKOTE COMPANY, Industrial Products Division, 30 Rockefeller Plaza, New York 20, N.Y.—55th & Alameda Sts., Los Angeles 54, Calif.

In Toronto, Ontario: THE FLINTKOTE COMPANY OF CANADA, LTD.

In London, England: Industrial Asphalts Company, Ltd.

For airports: Flintseal JFR (jet fuel resistant) is used to seal joints in airfield runways, taxiways, aprons and hangar floors.

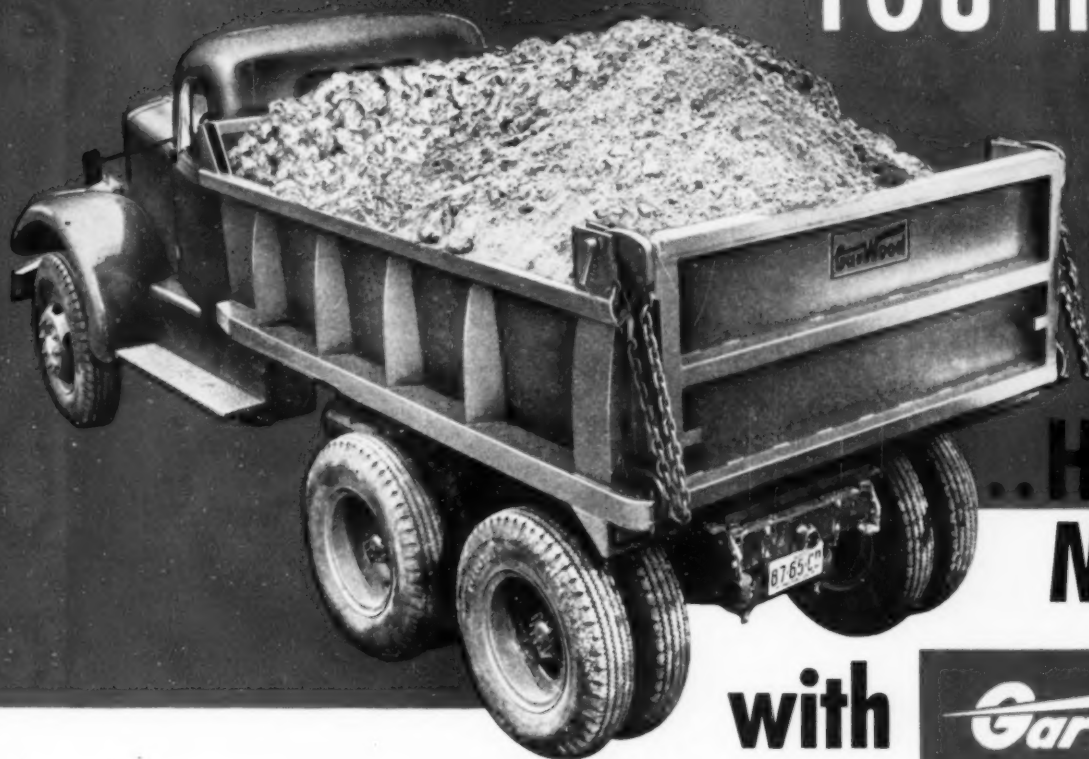
**Specialized Experience—
Over 50 Years At Your Service—**
by phone, mail or personal call...
no obligation.



Flintseal
HOT-POURED
JOINT-SEALING COMPOUND



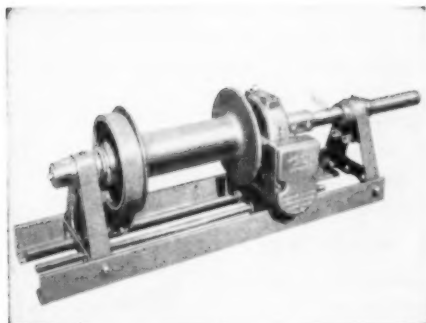
WHATEVER YOU HAUL



HAUL MORE

with

Gar Wood



If "pull" is your problem, a Gar Wood winch is the answer. Gar Wood winches are tougher . . . last longer . . . are safer to operate . . . require less maintenance. Self-energizing, automatic safety brake stops and holds any load up to winch capacity yet releases fully without drag. Write for information today.

It's True! Whatever you haul, you can haul more in Gar Wood Bodies *without exceeding legal load limits.* Gar Wood Bodies and Hoists are designed and built to eliminate dead weight without affecting vital strength and rigidity. This combination of minimum weight with maximum strength and rigidity assures extra payload—and extra profits—on every trip.

Box-type tailgate construction, forged steel tailgate pins and hooks, plus horizontal box bracing save dead weight yet put extra strength where it is needed to withstand load concentrations when dumping or spreading. Rear corner posts are extra strong to withstand shock loads and maintain permanent alignment. Rear apron is welded solidly to the corner posts for maximum rigidity. Body panels are reinforced with V-type braces to add extra strength without excessive weight.

There's a Gar Wood Body and Hoist Combination in every type and capacity to meet your every operating requirement. Find out today how you can *put more pay in your payloads* by putting Gar Wood Bodies and Hoists to work on your hauling job. Mail the coupon below NOW!



GAR WOOD INDUSTRIES, INC.
WAYNE, MICHIGAN

Gar Wood Industries, Inc.
36010 Main St., Wayne, Mich.
Attn: Customer Service Dept.

Please tell me how I can increase operating revenues by using Gar Wood Bodies and Hoists.

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

TRUCK EQUIPMENT: Dump Truck Bodies and Hoists, Winches and Cranes, Refuse Collection Bodies, Elevating End-Gates.
CONSTRUCTION EQUIPMENT: Excavators, Scrapers, Dozers, Ditchers, Spreaders, Finegraders, Truck-Mounted Road Graders.

FROM **ANY** ANGLE...



...**PAYLOADER** *PAYS*...

EVERYBODY concerned is pleased with the backfilling job John Rooff & Sons' "PAYLOADER" tractor-shovel is doing on this 12" water main installation. The contractor likes the 500 feet of daily progress being made . . . the water department knows it is getting a good solid backfill . . . the highway department is sure the "PAYLOADER" will not damage the pavement.

Dig! Load! Backfill! Stockpile! Lift! Carry! Strip! Push! Pull! The "PAYLOADER" does *all* these jobs. That is why it is one of the busiest machines on any project — and the most in demand. There are eight sizes of "PAYLOADERS," also a choice of four-wheel, rear-wheel or front-wheel drive to best fit your needs.

"PAYLOADER" Distributors — some 200-strong

in the U. S. and Canada — are ready to serve you with their modern parts department and service shops manned by experienced personnel. From ANY angle, it will pay to buy a "PAYLOADER" tractor-shovel — a *complete* unit built by the tractor-shovel pioneer, The Frank G. Hough Co., 768 Sunnyside Avenue, Libertyville, Illinois.

A SIZE FOR ANY JOB

Full information on any "PAYLOADER" model is yours on request:

Four-Wheel drive Models HM —
1 1/2 yd. and HR — 1 yd.;
Rear-wheel drive Models HY —
1 1/4 yd., HFH — 1 1/8 yd.,
HF — 3/4 yd., HE — 1/2 yd.;
Front-wheel drive Models HAH —
1/2 cu. yd., HA — 12 cu. ft.





PAYLOADER®

THE FRANK G. HOUGH CO. • Since 1920



OPERATION:

"PLANT RELOCATION"

**by Roger Sherman
with ROGERS TRAILERS**

It was a super-colossal "moving day" for Hamilton Standard Division, United Aircraft Corporation.

Roger Sherman of E. Hartford, Conn., tackled the job. 4000 machines were moved by a circuitous route to a new plant location 15 miles away.

Specialized rigging and hauling experience, plus the strong "back" of his new special-built Rogers 135-ton low-bed trailer, helped "turn the trick."

One huge plating machine 45 feet in length loomed up as a tough "nut to crack."

Original estimated moving time was 20 days. By handling it in one piece it was moved in 2½ days.

We are certain Rogers Trailers will meet your every-day requirements and handle those extra-tough jobs that often come your way.

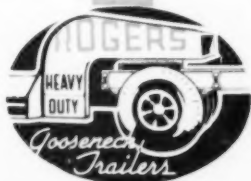
We'll be glad to chat with you.



Little tots along the moving route are awed by the sight of the towering press and the huge trailer.

The 95-ton hot-form press is loaded on the big Rogers 135-ton DPG Power-Lift Detachable Gooseneck Trailer.

**DISTRIBUTED IN
FORTY-SEVEN STATES AND
EIGHT CANADIAN PROVINCES**



**EXPERIENCE
builds them...
PERFORMANCE
sells them...**

ROGERS BROTHERS CORPORATION
ALBION, PENNSYLVANIA, U. S. A.

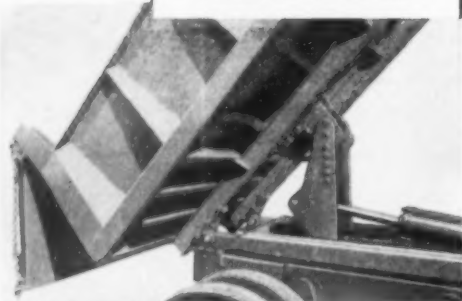
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with

GALION

no job is too BIG-or too TOUGH!



MODEL 880 heavy duty hydraulic hoist easily handles 10½ to 15½ ton loads

● Throughout the world, construction men depend on Galion dump bodies and hydraulic hoists to handle their toughest jobs. They like the extra years of service built into every Galion...their lower maintenance and operating costs. And, they are enthusiastic about Galion's Fulcrumatic hoist action that equalizes mechanical pressure, lifts more, easier...eliminates strain on truck and body.

Galion manufactures a complete line of standard and heavy duty hoists and dump bodies to meet virtually every construction need. However, if you need extra heavy duty or specialized units, Galion will be glad to design and build them for you.

A-6829

This is GALION'S Fulcrumatic action



Figure 1—As the cylinder rod moves out, a powerful starting leverage is applied at Fulcrum A in a vertical direction...the body lifts smoothly and evenly.



Figure 2—The body lifting effort is transferred to Fulcrum B as the rod continues outward...eliminating lift-shock and smoothing out lifting action.



Figure 3—As the body approaches full dumping position the lifting job is transferred to Fulcrum C...maintaining uniform pump pressure and a smooth, steady dumping cycle to the very end.



MODEL 700 hydraulic hoist with Model 12-3 contractor's heavy duty body is ideal for 6½ to 8½ ton payloads

THE



GALION

ALLSTEEL BODY COMPANY • GALION, OHIO

RUEMELIN BLAST GENERATORS

**FOR CLEANING BRIDGES—
WATER TOWERS—STRUCTURAL STEEL**



Many contractors use Ruemelin Blast Generators for cleaning steel work to remove rust, paint and scale before repainting. These machines are also used to remove laitance from cement wherever concrete construction is in progress. A wet adapting nozzle can be furnished to convert dry machines to wet type of operation. Built in several sizes.

Write for
Bulletin 36-C

**RUEMELIN
MFG. CO.**

3990 N. Palmer St.
Milwaukee 12, Wis.

Manufacturers
and Engineers
SAND BLAST AND
DUST COLLECTING
EQUIPMENT
WELDING FUME
COLLECTORS



**WHITE VIBRATORS OFFER
LOWER OPERATING COSTS**

INITIAL PRICE IS LOWER • ALL DRIVE SECTIONS ARE INTERCHANGEABLE • ALL VIBRATOR HEADS ARE INTERCHANGEABLE • LENGTH OF DRIVE IS UNLIMITED • ENGINE OR MOTOR POWER UNITS ARE OF STANDARD MANUFACTURE • MINIMUM OF SPARE PARTS REQUIRED • BACKED BY 20 YEARS OF SUCCESSFUL USE

For FREE circular, write—

Elkhart 20, **White Mfg. Co.** Indiana

MAKE NO MISTAKE . . . Jaeger gives you most air per dollar any way you figure

1. Compare your purchase cost: In every case, the price of your "new standard" Jaeger Compressor is lower than those asked even for out-dated "old standard" machines.

2. Compare your cost per cubic foot of air: Your "new standard" Jaeger, although it costs you less to buy, delivers 15% to 25% more cubic feet

of air per minute, at full 100 lb. pressure.

3. Compare your job costs: 15% to 25% more air means 90 to 100 lbs. pressure behind a full set of air tools instead of mere 70 lbs. pressure. This full pressure greatly increases their speed and impact, *actually produces 30% to 40% more work with the same men and tools.*



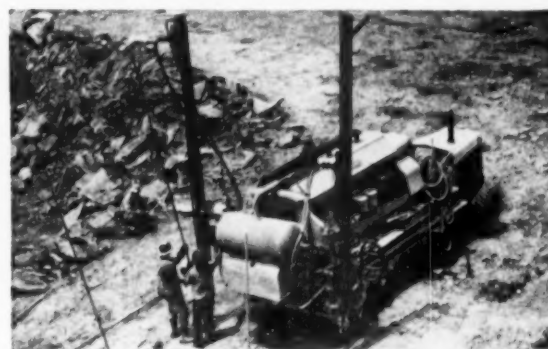
Model 75:—First compressor to run a heavy duty breaker efficiently.
Model 125:—First compressor to run 2 heavy duty breakers or one heavy rock drill efficiently.



Model 185:—First to run 3 heavy duty breakers efficiently.
Model 250:—First compressor to run 3½" wagon drill, 2 heavy rock drills or 4 heavy breakers efficiently.



Model 365:—First to run a 4" wagon drill with air to spare for plug hole drilling, or large Ka-Mo earth drill efficiently.



Model 600:—First to run 2 heavy wagon drills or a big 9B3 pile hammer efficiently. First "new standard" copied by the industry.

No other compressor, at any price, gives you these "air plus" features

- Balanced 2-stage, W-type compressor unit standard in every size from 75 to 600 ft. Cooler and smoother running than any V-type.
- 75% to 100% larger valves for free air flow, and up to 10 times longer valve life.
- Larger intercoolers and air receivers to cool and handle 15% to 25% more air.
- Relief valve for automatic drainage to insure drier, cleaner air, standard on all models.

- Positive lubrication by gear driven oil pump with flooded suction, standard on all models.
- Automatic "Fuel Miser" is standard on all Jaeger models where the automatic control of engine speeds effects worthwhile fuel savings.
- Bigger multiplate clutches than other compressors and bigger engines operating at conservative speeds.

For full details about compressors, tools and their air requirements ask your Jaeger distributor or send for Catalog JC-1.

THE JAEGER MACHINE COMPANY

223 Dublin Ave., Columbus 16, Ohio

AGGREGATE SPREADERS • CONCRETE SPREADERS AND FINISHERS • CONCRETE MIXERS • TRUCK MIXERS • PUMPS

When writing advertisers please mention **ROADS AND STREETS, May, 1953**

23

"Outlasts (Other Rope) Almost ... Tuffy Scraper Rope



Jobs like this one on the Pennsylvania Turnpike call for a scraper rope with flexibility, stiffness and super strength. Tuffy Scraper Rope fills the bill on all 3 counts.

Save Up to 50% on Rope Costs When **Tuffy** Takes Over

From his records of yardage and service life, this Nebraska construction company owner discovered that Tuffy Scraper Rope was giving him almost twice the service of a second rope he was using!

This meant that he could save nearly 50% on scraper rope costs by switching to Tuffy Scraper Rope!

Time after time, reports like this one show that Tuffy is paying off for thousands of other users in the construction field. And there's a good reason why: Tuffy Scraper is *specially made* to stand up under the strains and stresses imposed by wheeled scrapers . . . it's *not* just a standard rope. Tuffy is tailored to take greater drum crushing abuse, angle pulls through swivel mounted sheaves, crawling on flanges of guide rolls and edges of sheave housing.

Tuffy Scraper is *flexible* to withstand sharp bends over small drums and hug sheave grooves. Yet Tuffy has the *stiffness* needed to resist looping and kinking when slack! See for yourself how Tuffy pays off in longer runs and lower cost. When you order just ask for:

Tuffy Scraper Rope

REELS _____ FEET

How Many

Length

_____ inch in diameter.

*Name Furnished on Request.



union

Wire Rope

corporation

Specialists in Wire Rope
and Braided Wire Fabric

...2 to 1,"

Says

Owner of Middlewestern
Construction Company*,
Speaking of Tuffy
Scraper Rope.



Road construction puts extra strains and stresses on scraper ropes that ordinary wire ropes can't take. Tuffy Scraper Rope is specially made for use on wheel scrapers.

**3 More
Custom Created
Tuffy's
For Special Uses**



**Tuffy
DRAGLINE**

Gives extra flexibility, without sacrificing quality . . . spools better and rides better on grooves, hugs drum when casting. Provides maximum abrasive resistance through finer construction technique and toughened materials.



**Tuffy
DOZER ROPE**

A specially constructed $\frac{1}{2}$ " rope for tough dozer service. Mount a 150' reel just back of the wedge socket. Feed only enough through to replace the damaged part on the drum. Cut wastage of undamaged rope—cut down time one-half. Users report savings up to 300%.



**Tuffy
SLINGS**

Patented 9 part machine-braided wire fabric construction resists knots and kinks. Stands up longer than ordinary wire rope under heavy use. Proof-tested to twice safe working load.

GET THESE FREE FOLDERS



Tear Off and Mail Coupon Today!

union Wire Rope corporation

Specialists



In Wire Rope and Braided Wire Fabric

2200 Manchester Ave., Kansas City 3, Mo.

Please send the folders I have checked below.

- | | |
|---|---|
| <input type="checkbox"/> Tuffy Dragline | <input type="checkbox"/> Tuffy Scraper Rope |
| <input type="checkbox"/> Tuffy Dozer Rope | <input type="checkbox"/> Tuffy Slings |

Firm Name _____

By _____ Title _____

Address _____ City _____ State _____

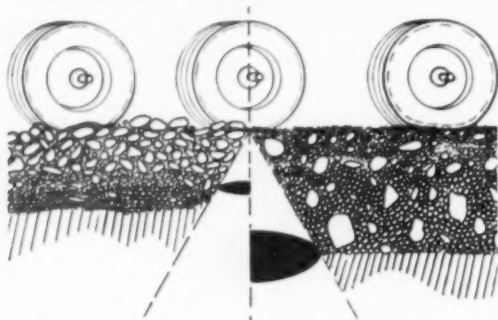
STOP

GRAVEL SEGREGATION!

only the **SEAMAN**
provides the
most efficiently
mixed and
blended base



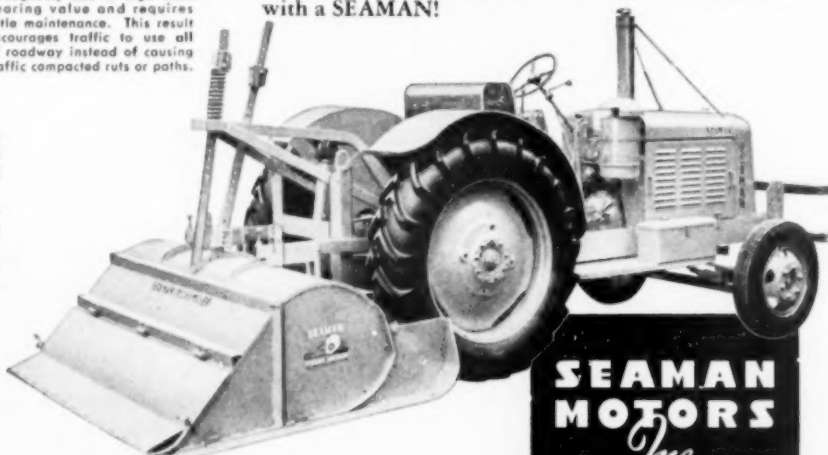
A gravel road in which bumps, undulations and rippling are developing because of gravel segregation. The loose gravel between wheel paths is dangerous and wasteful.



In segregated gravel (left above) the fines have sifted leaving larger stones on top. This is an unstable condition with low load bearing value.

Stabilized gravel (above right) is firmly blended and knit throughout, has a high load bearing value and requires little maintenance. This result encourages traffic to use all of roadway instead of causing traffic compacted ruts or paths.

FREE BOOK — The Seaman Self-Propelled Pulvi-Mixer and the SEAMAN Self-Propelled TRAV-L-PLANT are fully described in this new 12-page Bulletin. Also shown are many job scenes together with operational suggestions. Ask for Bulletin TPS. Send a postcard today.



The Seaman Self-Propelled Pulvi-Mixer, 7 foot mixing width. Gasoline or diesel powered. This unit will mix and finish one mile of 3 inch oil mix at a cost of less than approximately \$50.00.

**SEAMAN
MOTORS
Inc.**

291 N. 25th St.
MILWAUKEE 3, WIS.

Before you buy:

Talk to operators!



Notice the short-throw "Speed-o-Matic" levers. They operate at the touch of a finger.

Operators world-wide prefer the fast, easy, trouble-free *Speed-o-Matic* operation



◀ **WENDELL BLAIR**,
Inkom, Idaho —
"... fast, dependable,
not a bit of lost
time yet."



▶ **ROBERT GARNER**,
Libourn, Missouri —
"... dependable, accurate,
works steady,
does more."



◀ **LE ROY M. GEORGE**,
Tipp City, Ohio —
"... easy on the operator,
smoother, faster and
surer."



▶ **HOWARD EARL DEGREINIA**,
Westfield, Mass. —
"It doesn't jerk like
other rigs I've run."

WITH "Speed-o-Matic" control, operators don't have to fight the rig ... "end-of-the-shift" letdown is minimized. That's why they prefer "Speed-o-Matic" ... why "Speed-o-Matic" means more profit for you.

What's more, these *power-driven* hydraulic controls allow faster passes ... minimize wear and tear ... require far less maintenance than manual, air, vacuum, booster or other control systems ... and provide perfect "feel of the load."

To get all the facts on "Speed-o-Matic" controls and how they increase production, see your distributor or write:

LINK-BELT SPEEDER CORPORATION

Cedar Rapids, Iowa

13,155

LINK-BELT SPEEDER

CORPORATION

BUILDERS OF A COMPLETE LINE OF CRAWLER, TRUCK AND
WHEEL-MOUNTED SHOVEL-CRANES

**FACTORY-TRAINED
DISTRIBUTOR SALES
AND SERVICE SPECIALISTS
...EVERYWHERE**



THERE ISN'T ANY DUST ON A DOWFLAKE-TREATED ROAD!

DOWFLAKE keeps gravel roads from blowing away, makes them safer and protects surrounding area



Economy . . . safety . . . goodwill . . . all result from treating unpaved roads with Dowflake® (Dow calcium chloride 77-80%). And all are extremely important to road officials and the community.

Dowflake draws moisture out of the air, keeping the road damp, the dust down. Roads can't "blow away" due to heavy traffic and hard winds. This cuts down repeated gravel replacement, saves high material and labor costs.

Less dust means safer roads and better visibility. On Dowflake-treated roads motorists can see where they are going and traffic can safely move at a steady pace.

Housewives and farmers that live near unpaved roads

appreciate the benefits of Dowflake, too. It keeps the house free of dust; laundry can be hung out without fear of its getting dirty. The farmer's crops grow better and bring more on the market when they aren't laden with dust and dirt.

Write today and get the complete story on how Dowflake will make your roads more economical to maintain, safer to drive on and a credit to your department and your community. Inquire about Peladow®, Dow's new highest, pellet-form calcium chloride (94-97%) also engineered for highway use. In addition to 100 lb. bags, Peladow can be shipped in bulk in closed hopper cars. THE DOW CHEMICAL COMPANY, Midland, Michigan.

you can depend on DOW CHEMICALS



GM DIESEL
CASE HISTORY No. 528-84

USER: B.L. Anderson,
Cedar Rapids, Iowa.

INSTALLATION: 21 GM Diesels
(3, 4, and 6-71's and "Twin"
6-71's) powering shovels,
Koehring Dumpsters and three
portable rock crushers.
Firm produces 4,000 to 5,000
tons of road stone per day.

PERFORMANCE: Supt. L.V. Porter
reports GM Diesels have
reduced fuel and maintenance
costs considerably. Over-
hauls cost less and are
needed less frequently.
Crushers can run 7" material
without stalling engines.
Lighter weight of engines
has made equipment easier
to move.



It pays to STANDARDIZE on



CUT CRUSHING COSTS with GM DIESEL POWER

When this company replaced the gasoline engine in a shovel with a General Motors Diesel in 1945, fuel costs dropped 50%. That was B. L. Anderson's first GM Diesel. Now they own 21 units, because they found these engines reduce operating expenses.

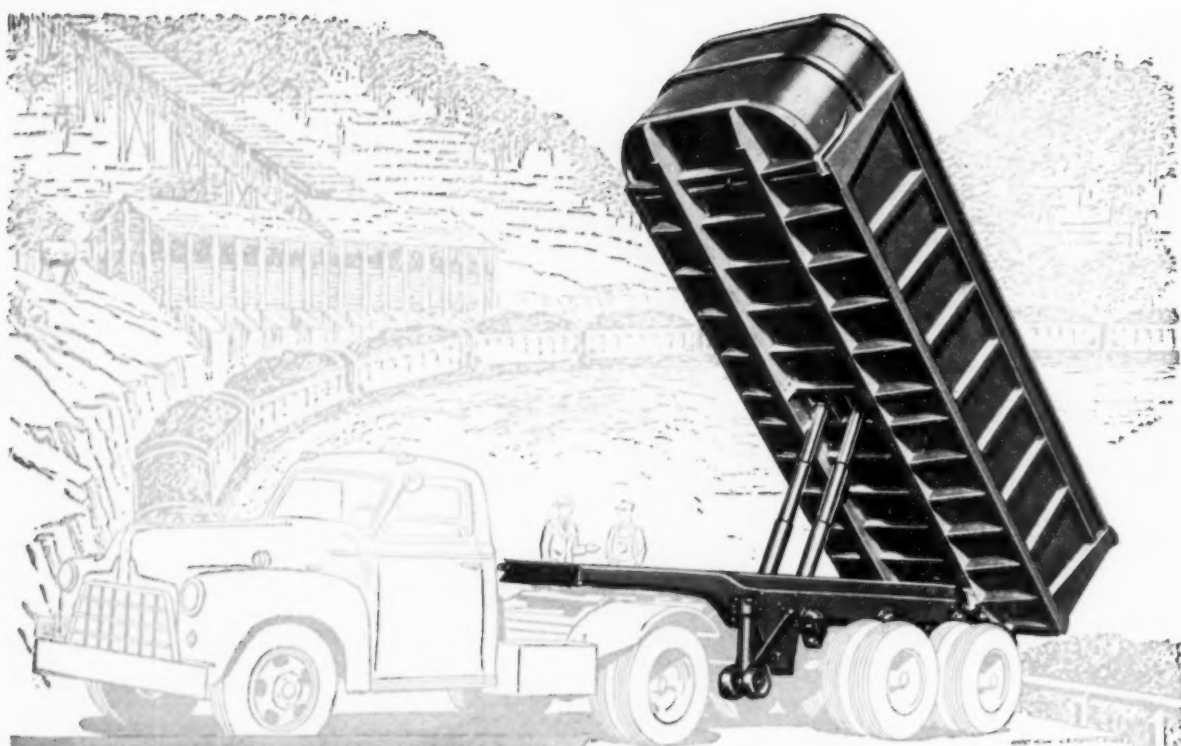
The GM Diesel boosts production in all kinds of heavy-duty jobs because smooth 2-cycle operation makes it accelerate faster under load changes. It starts quickly in any weather and operates on a miserly quantity of low-cost fuel. It delivers

dependable, economical power for thousands of hours without requiring major repairs.

And when service is needed, you'll find the cost surprisingly low. Compare parts costs with other Diesels, for example, and you'll quickly see what we mean. That's one of the many good reasons why contractors in every field are switching to GM Diesel power.

DETROIT DIESEL ENGINE DIVISION

GENERAL MOTORS • DETROIT 28, MICHIGAN
Single Engines . . . 16 to 275 H.P. Multiple Units . . . Up to 840 H.P.



use **MARION**
BODIES AND HOISTS
dump trailers for
haulage efficiency



MARION
BODIES AND HOISTS

Many Marion owners are purchasing additional Marion Dump Trailers. These owners know the extra benefits that can be expected from Marion equipment.

They know that these benefits mean dollars saved . . . because of greater load-carrying capacities, less maintenance cost and fewer man-hours per-ton payload.

Marion all-welded Trailer Bodies are constructed to withstand sagging or twisting when loads are uneven or extra heavy. Marion's Heavy-Duty Hoists operate with extremely low, even oil pressures . . . without high-surge points during any part of the lift.

Marion Hoists are specially designed to provide load stability throughout the dumping cycle . . . thus reducing the possibility of overturning when operating under adverse conditions.

Marion's "Designed on the Job" Dump Trailers and heavy-duty hoists have the built-in endurance that insures a dependable, performance-plus operation.

Get all the facts . . . call your nearby Marion Distributor or write direct—today!

METAL PRODUCTS CO.
Marion, Ohio, U. S. A.

Manufacturing a complete line of standard and special Hydraulic Hoists and Dump Bodies

Austin-Western Tandem Roller

SURFACE SMOOTHNESS
is its business



• Engineered from the ground up for precision operation, the Austin-Western Tandem Roller with its—

Variable Weight

Rigid Box Frame

Smooth Power

Hydraulic Steer

More Visibility

Less Overhang

More Clearance

Convenient Single or Dual Controls

meets all specifications for high-type surfaces... performs in a manner that satisfies the most exacting engineer.

Austin-Western also makes 3-Wheeled Rollers. Catalogs are yours for the asking.



Austin-Western

**Power Graders
Road Rollers-Motor Sweepers**



Construction Equipment Division

Manufactured by

AUSTIN-WESTERN COMPANY

Subsidiary of Baldwin-Lima-Hamilton Corporation

AURORA, ILLINOIS, U.S.A.

CONSTRUCTION HIGHLIGHTS



BUILDING RAILROAD BED — Here's a correctly matched earth-moving pair at work preparing the bed for a railroad spur in the yards of a large chemical plant. Up front is an Allis-Chalmers TS-300 Motor Scraper, moving up to 18 cubic yards of dirt every pass. Push-loading the TS-300 to a full, fast payload is an Allis-Chalmers HD-20 Tractor, with hydraulic torque converter drive.



Allis-Chalmers equipment at work . . .



WORKING OIL MIX king size. That's what this big AD-40 Motor Grader is doing on a black-topping job. Built-in power steering simplifies operator's work by eliminating tiring "wheel fight."



FEEDING RIVER SAND to dragline is a tough job, but this HD-9 takes it in stride. Its Positive Seal truck wheels, idlers, support rollers keep grease in, trouble out . . . require lubrication only every 1,000-hours.



BACKFILLING on a water main and sewer construction job is just one of dozens of ways cost-conscious contractors use the versatile HD-5 Crawler.



LOADING BIG BOULDERS from rock pile to truck is a simple matter for this Allis-Chalmers HD-20G with four cubic yard, front-mounted tractor shovel.



CLOSE-QUARTER WORK is made for the Allis-Chalmers Model D. This versatile motor grader handles dozens of jobs, from road building to landscaping, eas-

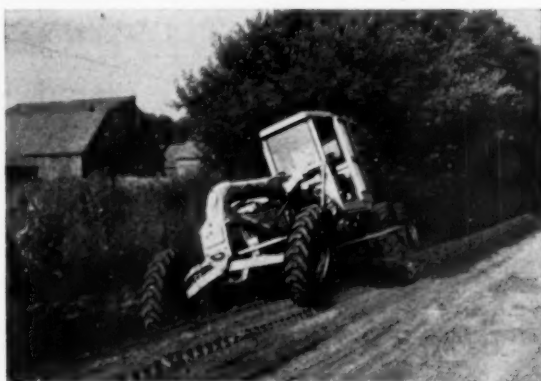
ily and at low cost. And its usefulness is multiplied by several easily mounted attachments, including hydraulically controlled scarifier and rear-end loader.

Continued on next page

Allis-Chalmers helping both small and big contractors . . .



WIDENING ROAD. Owner found his HD-15 gives him up to 25 percent more output on short cycle dozing, because operator can go from any forward to any reverse speed in just one lever shift.



BETTER DITCHES result because an AD-40 operator can see graders front wheels and both ends of blade . . . because he has the advantages of Allis-Chalmers exclusive ROLL-AWAY moldboard.



FULLY LOADED and ready to make a sharp, down-hill turn, this Allis-Chalmers 18-ton-capacity TR-200 Rock Wagon — with air brakes and low center of gravity — is under full control all the way.



ONE-MAN CONSTRUCTION CREW. This HD-9G with two cubic yard shovel, shown rough grading here, also lifts, dozes, digs, handles most bulk materials faster, better, more economically than before.



FLEET OWNERS GO ALLIS-CHALMERS, TOO. Contractors find the design advantages of Persian orange equipment bring more profit to their opera-

tions; and that rugged construction keeps it on the job longer. Now, to fit their jobs, they can select from seven scraper sizes . . . for use with any tractor.

handle today's jobs at lower cost . . .



HIGH-SPEED DIRT-MOVING TEAM loads and hauls big yardage on this large-scale operation. An Allis-Chalmers torque converter drive tractor helps load a trio of TS-200 Motor Scrapers and gives them a fast,

smooth start from the cut. Quick to get moving, these hydraulically controlled Motor Scrapers speed to the fill with capacity loads up to 13 cu. yd., and with positive forced ejection, dump fast and clean.



FINISHING BETWEEN FORMS takes precision work. That's what this contractor is getting from his Model D . . . the low-cost motor grader, proved on dozens of jobs by thousands of users.



TOUGH DOZING JOBS are made to order for the torque converter HD-20. Matching power to the load exactly, this huge tractor automatically moves load at highest speed that conditions permit.



DIGGING TRENCHES. This hydraulically controlled, front-end trench hoe is only one of a dozen attachments making Allis-Chalmers HD-5G the most useful tractor in the world.

GULF PRODUCTS and FINE SERVICE
keep equipment rolling
on Ohio River Flood Wall Project



Terry & Wright Construction Co., Louisville, Ky., has the contract for building a huge flood wall in Covington, Ky., on the Ohio River. The project involves moving nearly 1,000,000 cubic yards of dirt. The Lee Trucking Co. of Ewing, Va., a subcontractor, has the dirt hauling contract. Both companies report that Gulf lubricants are doing an outstanding protection job on equipment.



ANOTHER important construction project where equipment is making an outstanding record of dependable performance with the help of Gulf quality products and service.

Here are a few of the reasons why so many leading contractors prefer the products identified by the familiar orange disc: Gulf lubricants provide an extra margin of protection. Gulf fuels help insure full power. Gulf supplies expert engineering counsel and prompt delivery service. Result: fewer delays, lower maintenance costs, bigger profits!

Let us discuss with you how our products and services can help you on your next job. They are available to you through more than 1400 warehouses in 31 states from Maine to New Mexico.





P&H

HARD HITTING

STABILITY!

No question about it— you've got it
"on the hook" with a P&H!

Greater stability not only lets you handle heavy loads with less danger of tipping strains, but also enables you to use your power more freely — gives you the added capacity to get more done in a day's work.

Rolled alloy steels, welded throughout, give you the structural strength to take it in stride.

But it doesn't stop there. True tractor-type crawlers give you the smoothest, surest-footed mobility you've ever known on a power crane or shovel. You can turn gradually, sharply, or right about-face — maneuver in and out of tight corners with perfect ease.

You've heard P&H owners brag about what their machines will do. Isn't it time to find out for yourself? You've nothing to lose, much to gain in modern performance and lower costs.

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**HARNISCHFEGER
CORPORATION**

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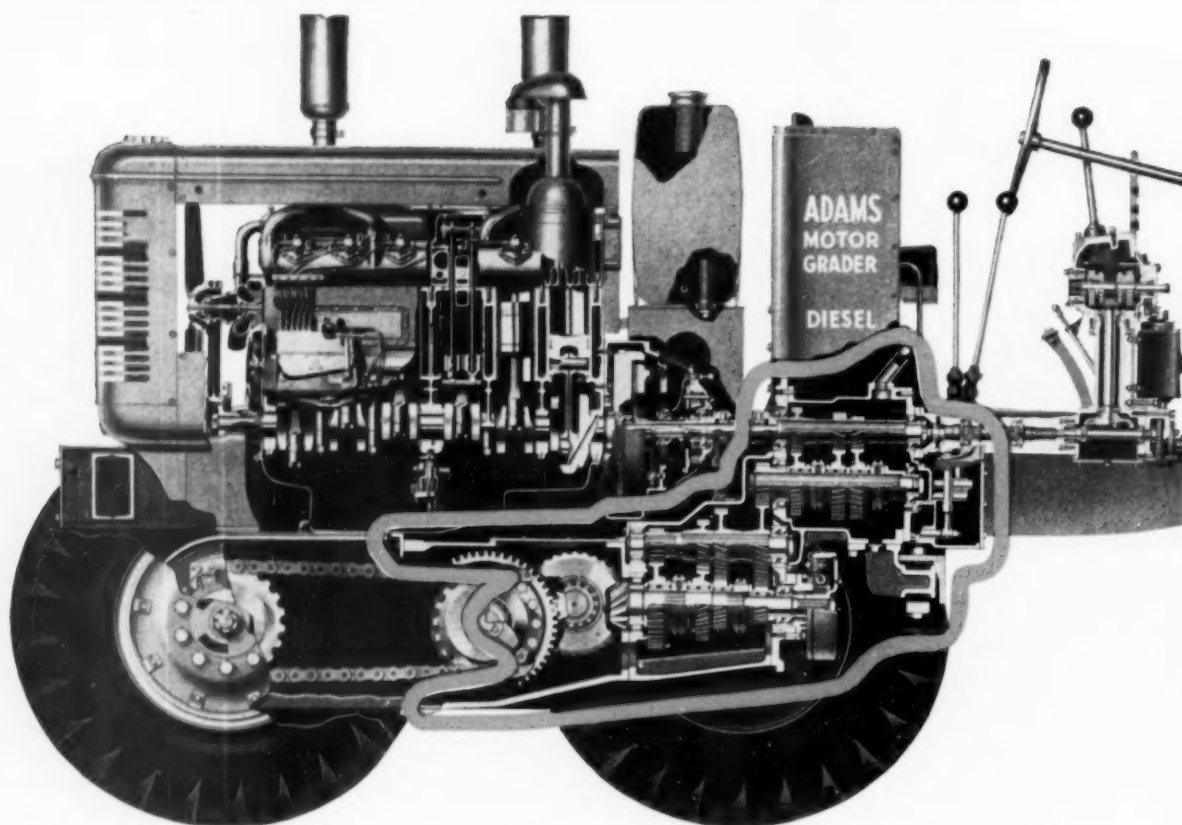
BOOM STABILIZERS



WELDING EQUIPMENT



OVERHEAD CRANES



Adams Offers New Constant-Mesh Transmission

Features Helical Gears, Anti-Friction Bearings Throughout and Creeper Gear Option

All Adams 100 h.p. motor graders now feature a new Adams-built constant-mesh transmission and a new final drive which have more operating advantages, more quality and longer life built into them than ever before put into any motor grader.

All transmission gears (excepting low) are helical and are shaved and hardened for quietness, maximum tooth contact and long life. All free-running gears turn on roller bearings. Gear shifting is easy and positive due to direct connection between shift levers and transmission. The final drive has the full-floating rear axle which characterizes all Adams motor graders. All gears, shafts, bearings, housings, etc. throughout transmission and final drive are built with a safe margin of strength and durability.

8 Forward and 4 Reverse Speeds

The new transmission has 8 forward speeds found in all Adams motor graders furnishing a wide range of operating speeds plus a high transport speed of 25 to 26 m.p.h. New are 4 reverse speeds, ranging from approximately $1\frac{1}{2}$ to $13\frac{1}{2}$

m.p.h. which save time on contract work and backing to buck snow drifts.

Creeper Gears New Optional Feature

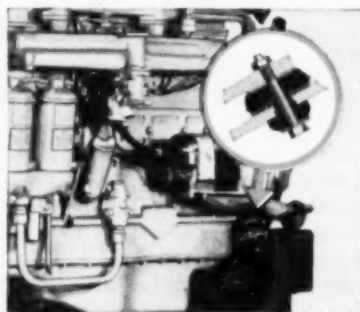
To permit extra-low speeds, desirable on some work, the new Adams transmission is designed to accommodate "creeper" gears which provide 3 speeds ranging from approximately $\frac{1}{4}$ m.p.h. to $1\frac{1}{4}$ m.p.h. These are in addition to the standard 8 forward speeds. The "creeper"

gears may be ordered as original equipment or may be installed at any time in the field at nominal cost.

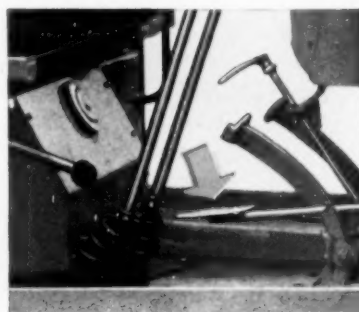
Dual Braking System Standard

The transmission has an external brake with internal expanding shoes which are actuated by the service brake pedal through the same hydraulic system which operates the wheel brakes. Braking efficiency is practically doubled. The same brake serves as a parking brake when set mechanically by parking brake lever.

New Transmission Also Brings These Improvements



Engines are rubber-mounted. Engine vibration is not transmitted to grader frame or operator's cab. This reduces operator fatigue and prolongs engine life.



Foot accelerator permits operator to regulate travel speed as with a truck. Valuable in traffic on overland travel. Operator uses accelerator or hand throttle when working.

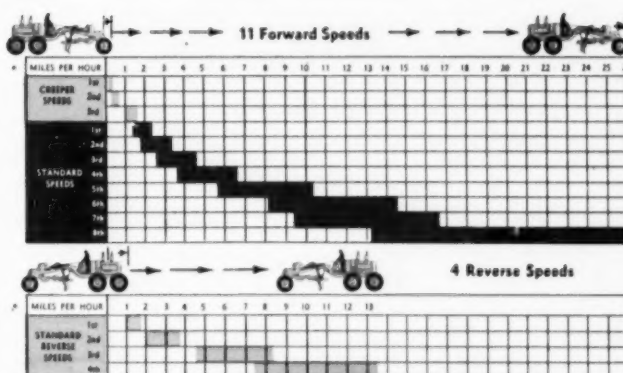
Contractor Praises ADAMS Motor Graders with New Constant-Mesh Transmission



● The Missouri Petroleum Products Co. of St. Louis are black-top contractors. Recently they put four 100 h.p. Adams Motor Graders with the new Adams transmission to work on scarifying old asphaltic concrete pavements and mixing and laying oil mat as pictured above. Mr. S. A. Whitmore, Const. Supt. is enthusiastic about their performance—their wide range of speeds—the high reverse speed and the fast transport speed. Further he says “they have more power and traction; will push larger windrows at higher speed which results in more work per day.”

Ask your local Adams dealer to show you one of these new, powerful machines. Phone him today.

J. D. ADAMS MANUFACTURING CO., INDIANAPOLIS, IND.



Charts above show the range of Adams 8 forward speeds and 4 reverse speeds which are standard in the new Adams constant-mesh transmission. At top are shown the 3 “creeper” speeds which are optional.

*Make your next
motor grader an*



TOURNATRACTORS

outproduce crawlers despite double haul distance

**Tournatractor-scrapers move 1839 station yards hourly,
crawler-scrapers 687, on Iowa highway job**



Tournatractor with scraper heaps 12 pay yds. of clay in average of 75'. When not busy pulling scrapers, rig did pusher duty. Says George Lowe, "Tournatractors have plenty of power." Adds Operator Gerald Otting, "I like Tournatractor for a pusher because it's fast and easy to handle."

Time studies taken recently on Lowe Construction Co.'s 222,750-yd. highway relocation job near Cedar Rapids, Iowa, reveal some interesting comparisons on production of rubber-tired Tournatractors vs. crawler-tractors.

Pulling same size scrapers (17½ yds. heaped), both Tournatractors and crawlers push-loaded 12 pay yds. of clay per load. Haul times, however, varied widely. Tournatractors, with 19 m.p.h. top speed, regularly made a 4200' cycle every 6.8 minutes. Crawlers, with top of 6 m.p.h., completed a 1900' cycle every 8.35 minutes. Tournatractors averaged 9 m.p.h. on haul and return, for 7¼ trips hourly . . . crawlers averaged 3.4 m.p.h., for 6 trips hourly. In other words, Tournatractors made more trips per hour despite a haul distance double that of the crawler-tractors. On a station yard basis, Tournatractors moved 165% more dirt than the crawlers — 1839 to 687 station yards per hour.

COMPARATIVE TIME STUDIES

Project: Relocate U.S. 30 for overpass of Rock Island Railroad line. Required 37' fill to raise level of approach road 7' above overpass columns.

Location: 6 miles south of Cedar Rapids, Iowa

Contractor: Lowe Construction Co., Marion, Iowa

Material: 222,750 yds. moist blue and yellow glacial clay loaded from borrow pits. All scraper rigs push-loaded by same tractors.

Tournatractor-scrapers vs. crawler-scrapers

	Equipment	Cycle Time (average)	Yards per trip	Trips per 30-min. hr.	Pay Yds. per hr.	Station Yds. per hr.
One-way haul of 2100' with 550' of 5% adverse grade	Tournatractor-scraper No. 1	6.57	12	7.6	91.2	1915
	Tournatractor-scraper No. 2	7.09	12	7	84	1764
	Tournatractor av.	6.88	12	7.3	87.6	1839
One-way haul of 950' with 120' of 10% adverse grade	Crawler-scraper 1	8.18	12	6.1	73.2	706
	Crawler-scraper 2	8.51	12	5.9	70.8	672
	Crawler-scraper 3	8.34	12	6	72	684
	Crawler-scraper av.	8.35	12	6	72	687



WHY CRAWL WHEN YOU



Works faster and cheaper

Here's why Tournatractors beat the crawlers: constant-mesh "instant-shift" transmission put the rubber-tired tractor's 19 m.p.h. speeds to most efficient use. Operator did not have to stop or slow down to change gears. 186 h.p. with rubber-tired traction helped Tournatractor get a heaping load fast. Rig then highballed to the fill fast—at speeds up to 19 m.p.h.—without losing vital momentum. With the fast acceleration, high speeds and exceptional mobility, rubber-tired Tournatractor will lick any track-type tractor on the market, regardless of haul length. It will put more pay yards on the fill . . . more dollars in your pocket.

Let us prove our case by showing you the Tournatractor in action on your job. If you would like more information, or if you would like to arrange for a demonstration, send in the coupon below. There's no obligation.

Send NOW to

R. G. LeTOURNEAU, Inc., Peoria, Illinois

Tell us more about rubber-tired Tournatractor

Name Title

Company

Street

City State

☐

Would like demonstration on my job

T-308-H

"Tournapulls good all-around machines"

Lowe's 5 D Tournapulls worked same 4200' cycle as the 2 Tournatractors. In first 70 working hours, this fleet of 7 rubber-tired units moved a total of 32,000 pay yds. (by cross-section). Prior to this job, 4 of the "D's" did 235 miles of ditching near Cedar Rapids . . . traveling in a 250-mile radius job-to-job under their own power. One 130-mile trip took Tournapulls 7 hours. Owner George Lowe says, "There's no more versatile machine on ditching than this D Roadster. We've had exceptionally good work with them." Adds Grade Foreman Thomas Clark, "For shouldering, you can't beat the D Tournapulls. They're good all-around machines . . . good in mud, too."



Tournapull—Trademark Reg. U. S. Pat. Off.
Tournatractor—Trademark T-308-H

CAN RUN ?

R. G. LeTOURNEAU, INC.
Peoria, Illinois

HERE ARE HELTZEL'S NEW COMPLETELY AUTOMATIC ELECTRONICALLY CONTROLLED BATCHING PLANTS...



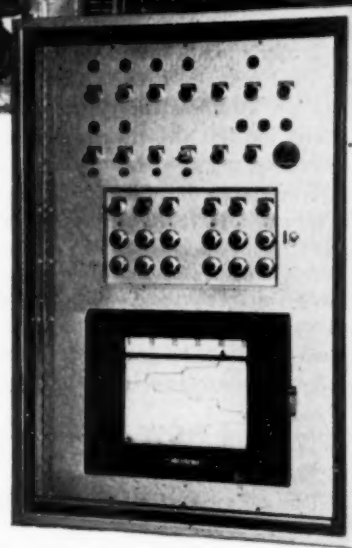
Two new Heltzel Batching Plants at work on the Ohio Turnpike. Built to conform with Ohio Turnpike Commission specifications, the Cement Plant (left) has a 400 bbl. capacity with a 375 bbl. recirculator. Three-compartment aggregate Plant (right) holds up to 200 tons.

Here's real news for contractors who want batching equipment that will do more with less labor. The new electronically actuated fully automatic Heltzel plants designed for road builders, truck mixer and central mix operations.

Push button operated by one man these job-tested plants will batch up to 250 yards of perfectly proportioned batches per hour . . . with 29 separate batch combinations immediately available to the operator. Each batch, time and amount electrically recorded for easy daily tabulation.

Portable, the plants were designed for quick set-up and knock-down, easy over-the-road handling. For permanent installation Heltzel's combination cement-aggregate plant would be used instead of two separate plants.

For additional information write or call **The Heltzel Steel Form and Iron Co., Warren, Ohio**, and ask for Bulletin O-21.



Push button panel with recording equipment. Each of the 29 batch selection buttons controls a completely different mix. Panel will be wired to suit your individual requirements. Recording equipment optional.

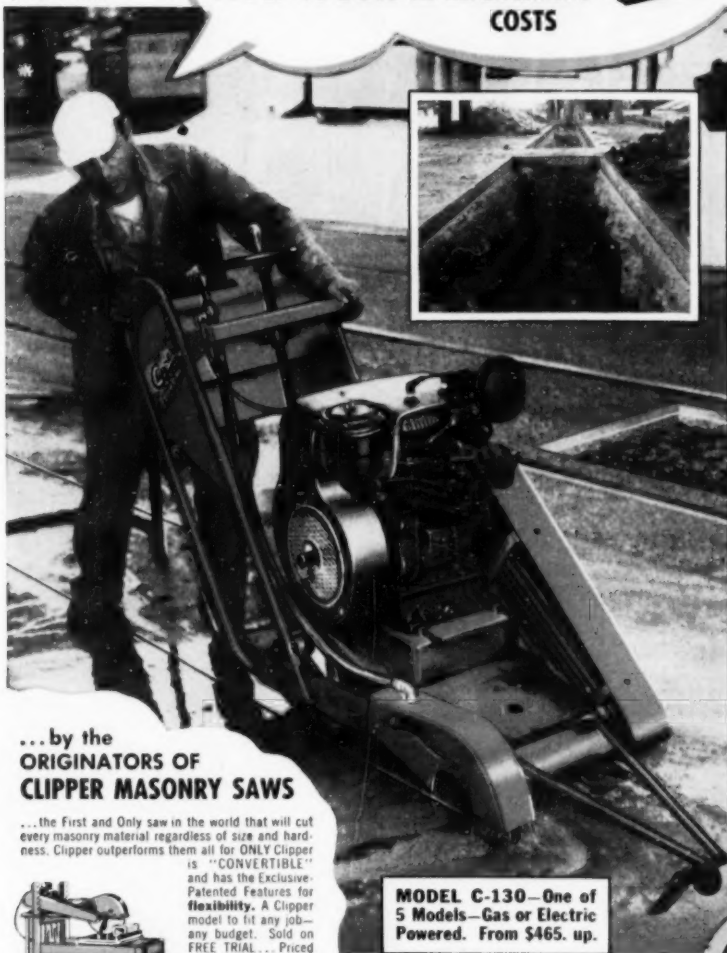
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SUSPENSION



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MANEUVERABLE

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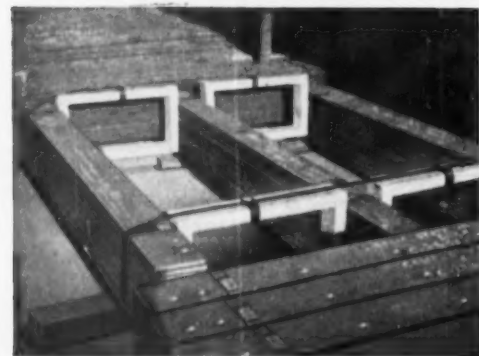
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they increase the efficiency
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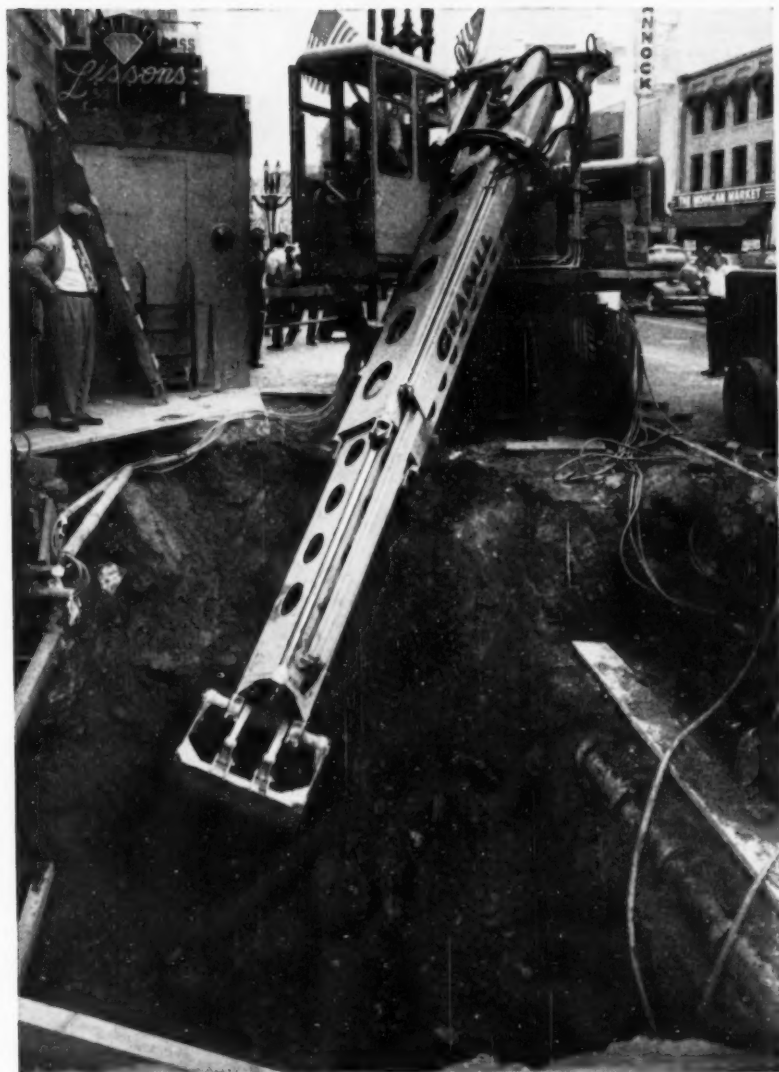
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48% REPEAT SALES!



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YES, almost *half* the Gradalls sold go to present Gradall owners—contractors, highway departments, municipalities, railroads—people who *proved* for themselves how this multi-purpose machine pays off!

They have proved that a single investment in a Gradall gives them a machine that does the work of many. They tell us the Gradall is usually the first machine on the job, the last one off. It's kept busy on a wide variety of projects—excavating, ripping and loading pavement, grading, backfilling, cleaning tracks and roadbeds, digging and cleaning ditches, and many more—working to hand-finish "specs" *without* hand labor. And after completing one job it's soon ready to tackle the next—with less than five minutes to change attachments.

Owners *know* what a Gradall can do. You, too, can find out how its hydraulic, telescoping arm-action and its many uses can make money on *your* operations. Just contact your Gradall Distributor for a field demonstration.

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READY TO MOVE AS A HITCH HIKER

**MANY BUTLER PORTABLE
BULK CEMENT PLANTS
HAVE BEEN MOVED
MORE THAN 50 TIMES**

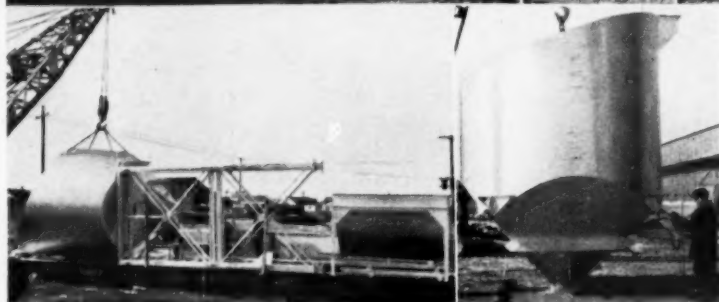
Unless you're filling the Black Hole of Calcutta with concrete, portability is an important factor in your Roadbuilders' Plant. It's no trick at all for 2 men and a crane to set up, knock down and move a Butler Plant.

One-piece tank construction, pin-connected columns and bracing, properly placed lifting lugs and ingenious design all contribute to the amazing portability of Butler plants. Their component parts — bins, screw conveyors, elevators and batchers — are Butler-engineered to save time and labor while assuring proper flow of cement.

Overhead storage capacity of the Butler 250 barrel plant is ample for any paving job, particularly when supplemented by 400 to 675 barrel overflow bins. A complete combination plant will provide at least 1½ carloads capacity — maximum protection against shutdowns or other costly delays.



Complete bulk cement plant on a flatcar. Tank is swung around and laid flat on the ground.



Tank is lifted just clear of ground while men raise column frames with chain hoists and pin them in place.



Going up. Legs hinge down into place with cross bracing attached. Lift is not high.



Assembled with chain and buckets, elevator is swung into place.



Complete plant is ready to operate as men make final adjustment on batcher.



For complete information on Butler Portable Bulk Cement Plants as well as Portable Batching Plants, your postcard will bring you Butler Bulletin 205.

BUTLER BIN CO.

959 Blackstone Avenue
WAUKESHA, WISCONSIN

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Eimcos moving earth for fill to build major link in Pan American highway in South America.

MOVING MATERIAL

Fast

Building levees, highways, for bulldozing, clearing boulders from highways — any job that requires low cost earth or rock moving is best done with Eimcos.

These rugged, heavy-duty loading machines are finding their place in state highway departments, county and municipal road jobs, in sand and gravel pits, in steel mills and among contractors on heavy construction and airport jobs.

Investigate the cost of handling material the Eimco way before you buy.



Above: As a bulldozer. Below: Road building job in Austrian Alps. The shape of the Eimco bucket and the rocker-arm digging action make it possible to pick up and move pieces much larger than with other equipment.

EIMCO⁴⁴⁶⁹

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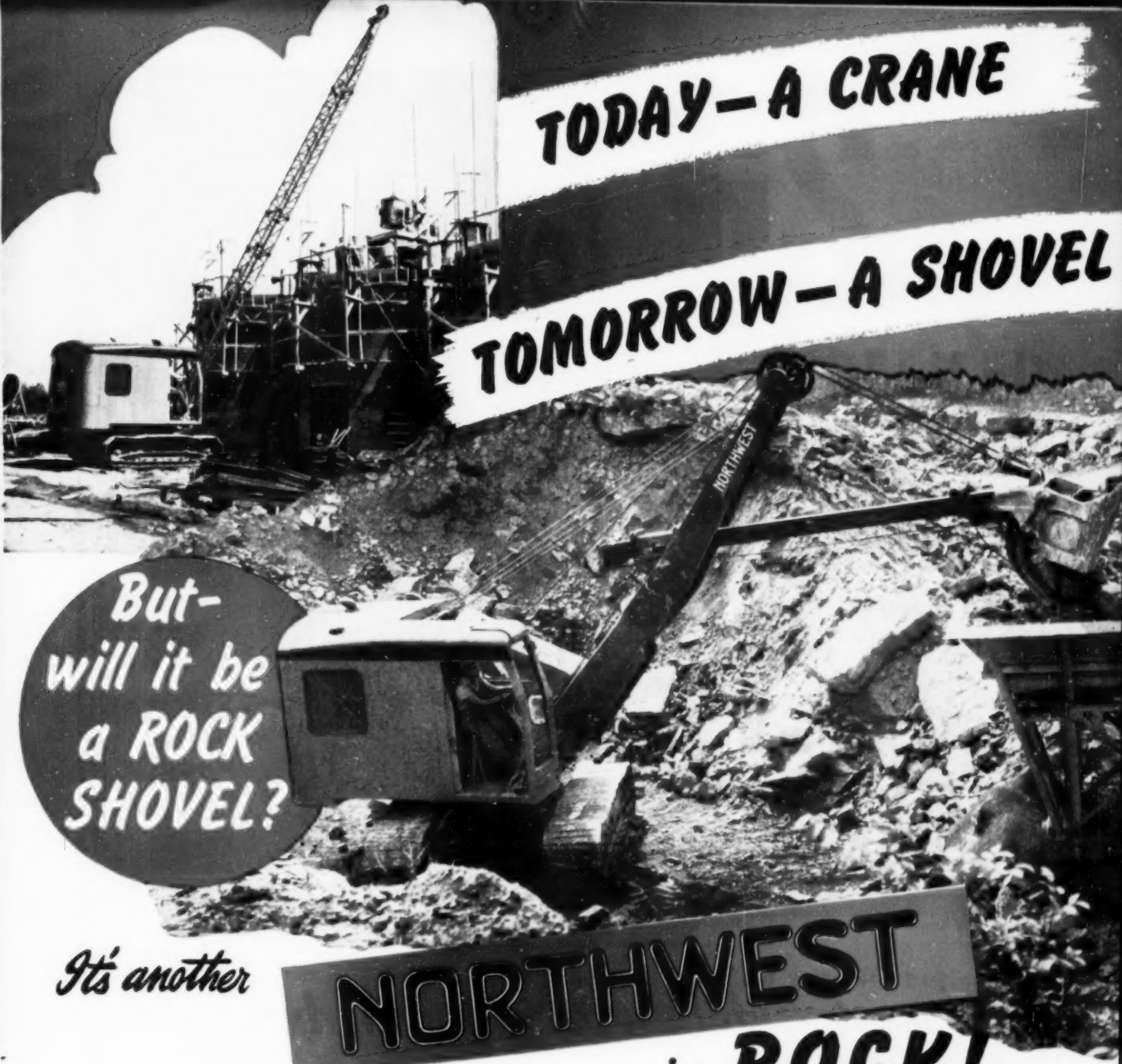
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**But—
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There are always tougher jobs ahead! Today you start in with crane operation. Tomorrow you may be faced with a shovel problem and conversion of your equipment. What kind of a shovel is *your* crane going to make? Will it be a Rock Shovel?

If you have a Northwest you know what it will be. You've probably proved it to be a *real* Rock Shovel just as so many Northwest owners have. High output in rock is one of the many reasons why one out of every three Northwests sold is a repeat order.

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Be sure when you buy your Shovel, Crane, Dragline or Pullshovel that you will get the *best* in performance no matter what boom you mount on it.

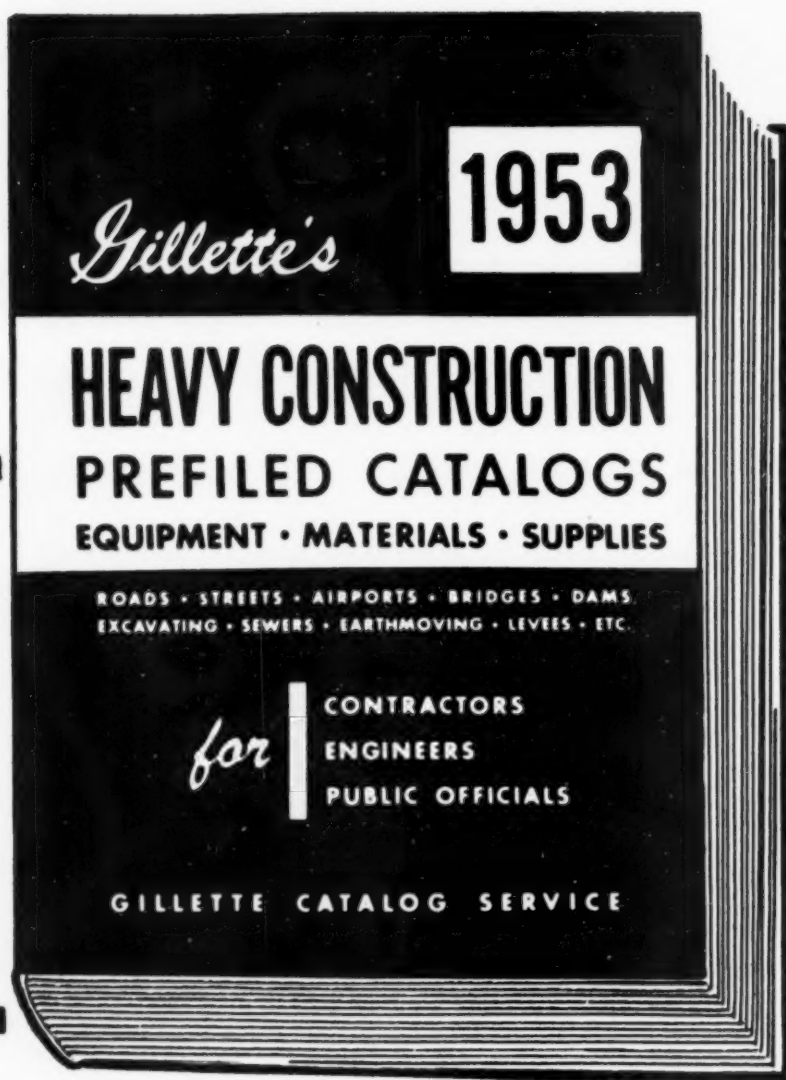
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The manufacturers listed below have followed your wishes—and at considerable expense. Through the PREFILED method they have supplied you with catalog information on their products in the current 1953 edition of Gillette's Heavy Construction Catalog File (See opposite page). Be sure to take advantage of this information. Use the Gillette Catalog File all the time. Keep it handy every day—every week. Use it often. Consult the Catalog File when you want information before buying new equipment, materials or supplies.

Here is the list of manufacturers who have supplied you with buying information on their products.

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 Allis-Chalmers Manufacturing Co.
 All Purpose Sprayer Company
 American Air Filter Co.
 American Bosch Corporation
 American-Coleman Company
 American Mangnese Steel Division
 American Marietta Co.
 American Steel & Wire
 American Trailer Equipment Corp.
 Anthony Company
 Armo Drainage & Metal Products, Inc.
 Arrow Manufacturing Company
 Austin-Western Company
 Baldwin-Lima-Hamilton Corp.
 Badger Machine Co.
 C. L. Ballard
 Boardley and Piper
 Bicknell Manufacturing Company
 Briscoe & Son, E. V.
 Bros Boiler & Mfg. Co., Wm.
 Buda Company, The
 Buffalo-Springfield Roller Co., The
 Butler Bin Company
 Carey Manufacturing Co., The Philip
 Carson Company, H. Y.
 Carter Co., Ralph B.
 C. H. & E. Manufacturing Co., Inc.
 Chausse Manufacturing Co., Inc.
 Cleaver-Brooks Company
 Cleveland Farmgrader Co., The
 Cleveland Frig and Crossing Co.
 Cleveland Trencher Company, The
 Clipper Manufacturing Co.
 Clyde Iron Works

Concrete Surfacing Machine Co.
 Crockett Brothers
 Cummer & Son Company, The F. D.
 Cummins Engine Company, Inc.
 Davenport Baler Corporation
 Detroit Diesel Engine Division
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 Ottawa Steel Products, Inc.
 Owen Bucket Co., The
 Pacific Car and Foundry Company
 Page Engineering Company
 Philadelphia Textile Finishers, Inc.
 Phoenix Products Co.
 Pioneer Engineering Works
 Pitman Manufacturing Company
 Porter, Inc., H. K.
 Resulite Steel Corporation
 Riddell Corp., W. A.

Rogers Brothers Corporation
 St. Paul Hydraulic Hoist
 Salem Tool Company, The
 Sauerman Bros., Inc.
 Schramm, Inc.
 Service Supply Corporation
 Servisized Products Corp.
 Shunk Manufacturing Company
 Standard Steel Corporation
 Sterling Engineering & Mfg. Co.
 Stow Manufacturing Company
 Summer Equipment Limited
 Super-Compactors, Inc.
 Symons Clamp & Manufacturing Co.
 Syntree Company
 Talbert Construction Equip. Co.
 Tarrant Mfg. Co.
 Thurman Machine Co., The
 Timken Roller Bearing Co., The
 Titan Chain Saws, Inc.
 Transport Trailers, Inc.
 Tutthill Spring Company
 Universal Engineering Corp.
 Vibro-Plus Products, Inc.
 Vulcan Tool Manufacturing Co.
 Warner & Swasey Co.
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Let a Toncan Iron Manufacturer listed below send you "specs" and data on Toncan Iron Metal Drainage Structures. Or write to

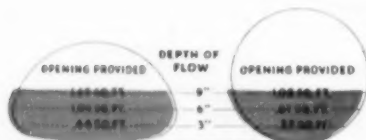
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PORTLAND, ORE.
BOISE, IDAHO
DENVER METAL CULVERT CO. INC.
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BLINDHART PIPE & CULVERT CO.
LOUISVILLE, KY.
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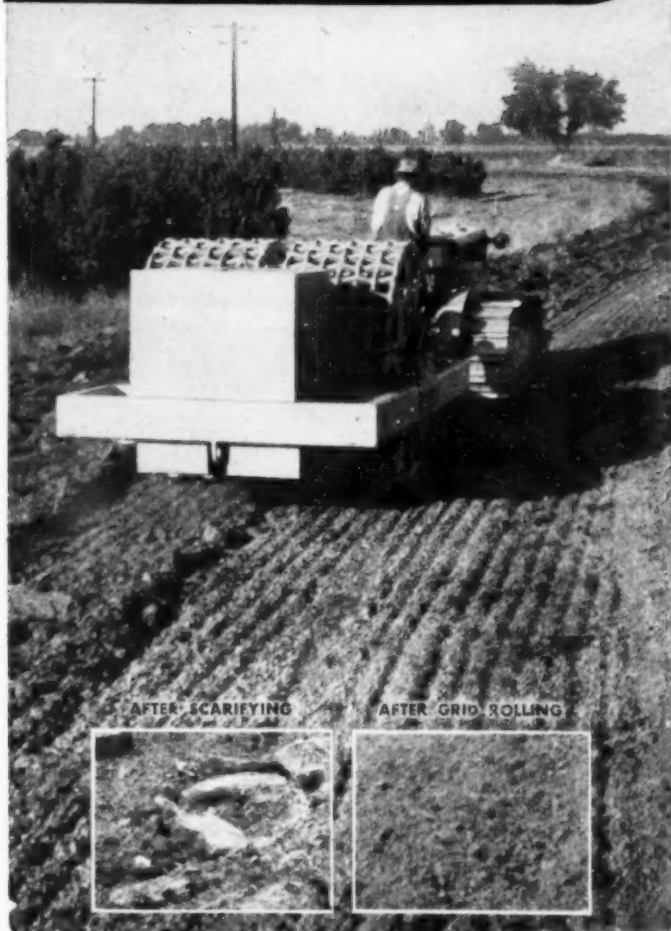
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for faster salvaging of
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No other single piece of road building equipment can match the Hyster Grid Roller in dollars returned per dollar invested! Progressive road builders and officials of counties, townships and municipalities throughout the country are adopting the Grid Roller method because it results in a *better* job, yet makes possible *substantial* savings. For limited or fixed budgets this means *more miles of road can be repaired or rebuilt.*

Key to savings is the fact that the Grid Roller performs three functions: (1) salvages the old surface material, (2) compacts the base, (3) rolls the new surface. On the job illustrated here, for example, involving only 1.6 miles of rebuilt road, savings approximately *matched the cost of the Grid Roller!*

A new 16 MM sound motion picture will be available soon showing the Grid Roller in action on different types of black top jobs, including the job illustrated here. Make arrangements now to see this motion picture at your Caterpillar-Hyster dealer, or write for information to:

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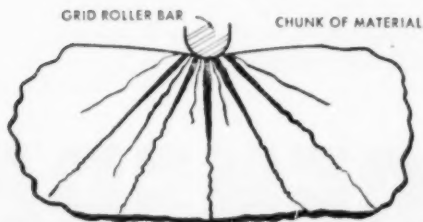
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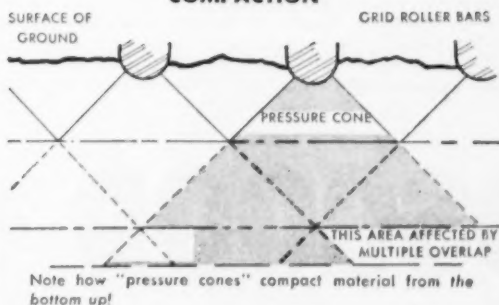
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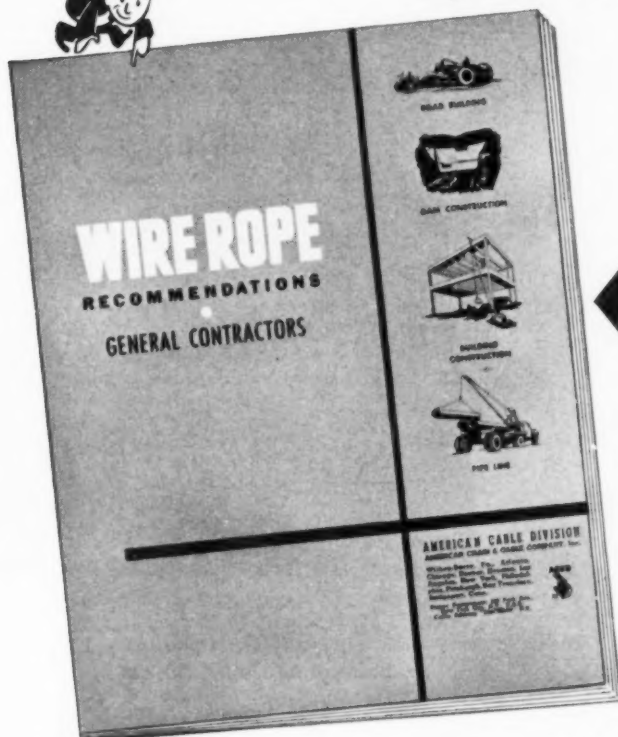
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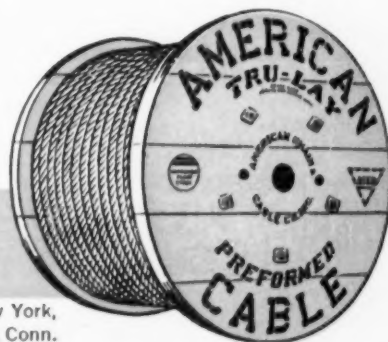
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Roads and Streets in the News

Congress Launches Far-Reaching Review of Federal Highway Policies

Hearings began April 15 in Washington that promised to have a far-reaching effect on future federal highway policy and legislation. The House committee on roads under Chairman J. Harry McGregor (Ohio) expects to hear testimony on fourteen questions which constitute an exploration of the whole national highway question. Witnesses are scheduled to appear representing the various associations and the state, county and other government highway departments.

A concurrent Senate resolution is expected to result in similar hearings by the Senate committee on roads under Chairman Frances Case (S. D.).

The questions, briefly stated, are as follows:

- (1) Proposal of the Conference of State Governors that the Federal Government relinquish taxing of motor fuels in favor of the states.
- (2) Proposal of the Conference of State Governors that activities of the Bureau of Public Roads be curtailed.
- (3) Proposal that federal motor fuel taxes be deposited in a trust fund for highway financing purposes.
- (4) Proposal for the extension of turnpikes and toll roads as well as transcontinental superhighways.
- (5) Proposal to increase federal funds for use on the Interstate System.
- (6) Possible participation of the federal government in highway maintenance and repairs.
- (7) Comparison of administrative and engineering costs for highways in the various states.
- (8) Study of direct local effect—beneficial or detrimental—of the construction of by-passes around urban areas.
- (9) Proper cost allocation methods with respect to access roads.
- (10) Relation of existing highways to military and civil defense requirements to meet emergencies.
- (11) Coordination of federal agencies in the planning and construction of highways in national parks, national forests and other government land areas.
- (12) The effect of heavy vehicle traffic on highway specifications and construction costs.
- (13) Present highway safety programs and means of increasing their effectiveness.
- (14) Miscellaneous legislative proposals to improve the federal-aid highway program.

These hearings spotlight the historic interest of the federal government in highways, as expressed by the succession of Federal Aid Highway Acts in the past several decades. This interest is based on Article 1, Section 8 of the Constitution, whereby the government is charged with the regulation of interstate commerce and post roads. Recently there has been a growing pressure to relate federal highway policy to tax policy, with a particular desire to bring about a return of highway user tax revenues to the people in the form of highway aid.

The highway hearings here announced are in line with the President's special message to Congress on March 30, in which he recommended enactment of legislation to establish a commission on governmental functions and fiscal resources, to make a thorough study of grants-in-aid activities and the problems of finance and Federal-state relations that attend them.

His message included the statements: "The present division of activities between Federal and state governments, including their local subdivisions, is the product of more than a century and a half of piecemeal and often haphazard growth. This growth in recent decades has proceeded at a speed defying order and efficiency. One program after another has been launched to meet emergencies and

expanding public needs. Time has rarely been taken for thoughtful attention to the effects of these actions on the basic structure of our Federal-state system of Government.

"Now there is need to review and assess, with prudence and foresight, the proper roles of the Federal, state and local governments. In many cases, especially within the past twenty years, the Federal Government has entered fields which, under our Constitution, are the primary responsibilities of state and local governments."

Du Pont takes over as Public Roads Commissioner

The new Commissioner of Public Roads, Francis V. du Pont is likely to carry on with much of the philosophy of retiring Commissioner MacDonald, according to an unofficial observer. The new commissioner is also expected to inaugurate some vigorous new policies.

Meantime, it is indicated that as far as personnel changes are concerned, the only immediate policy will be to not extend the employment of employees reaching age 70. Some retirements will result in the near future from this decision, which is designed to give added incentive to younger men coming up through the organization.

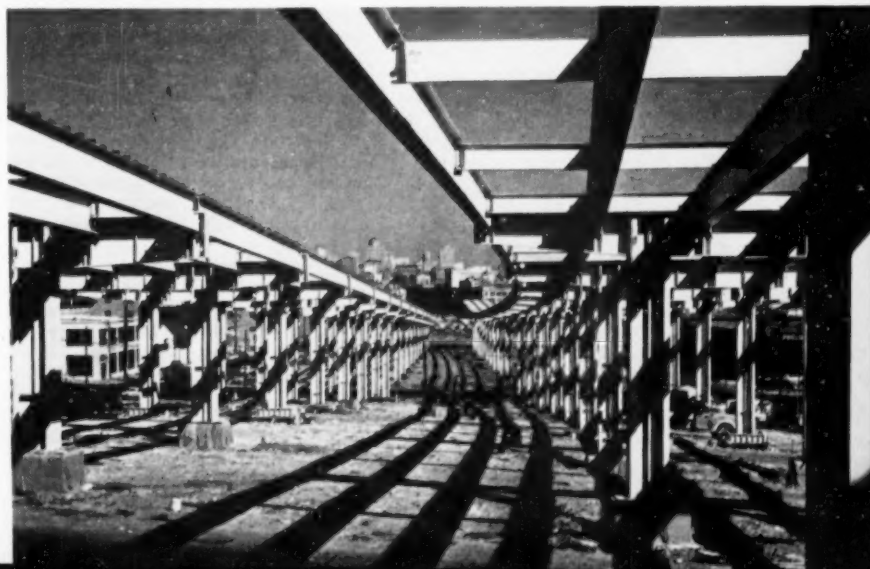
Commissioner du Pont was appointed to head the Bureau by Secretary of Commerce Sinclair Weeks, with the approval of President Eisenhower. He succeeded Thomas H. MacDonald who retired April 1 after 34 years in office (see editorial page).

Du Pont has a long record of high-

World's longest all-welded viaduct progresses

★ Nearing completion in San Francisco is the largest all-welded highway bridge ever undertaken. Designed and supervised by the California Division of Highways, as part of the urban freeway system for San Francisco, the bridge is being built by Chas. L. Harney, Inc., general contractors. Bethlehem Pacific is fabricating and erecting the steel for the \$3,000,000 job

57





★ Proposed net-work of thruways and expressways planned for Connecticut in 10 year program. Solid lines, built or under construction. Broken lines, proposed

way administrative service as a member of the Delaware State Highway Department from 1923 to 1949, including 23 years as chairman. He is credited with developing the highway system of his state into one of the most modern in the nation. During his regime in Delaware, the dual highway system was inaugurated, and such important arterials as the Governor Printz Boulevard were designed and constructed.

Mr. du Pont was responsible for directing the engineering, financing and commencement of construction of the \$40 million Delaware Memorial Bridge, the fifth longest suspension span in the world.

In addition to highway activities, Mr. du Pont has extensive private commercial interests. He is Treasurer of the Hotels Waldorf-Astoria in New York City, the Bellevue-Stratford in Philadelphia, the Willard in Washington; and president of the Equitable Building, New York City, and the Equitable Trust Company, Wilmington, Delaware.

The Commissioner holds a mechanical engineering degree from Massachusetts Institute of Technology (1917).

The American Association of State Highway Officials, at its annual convention in Salt Lake City, Utah, September 21, 1948, awarded the following citation of distinction to Mr. du Pont. It said that the Association, "appreciative of the benefits accruing to the public from the accumulated and continuous experience of those who make the public service their life work, and desirous of recording its appreciation of such long and faithful service by its members, hereby extends to F. V. du Pont, Delaware, after the twenty-fifth year of meri-

torious public service, these congratulations and good wishes for a long and happy continuance in this chosen field of work."

"Par" movement leaders report good 1st year

A little more than one year ago the PAR movement was born. Much has been done in that eventful twelve month period toward stimulating needed improvement of primary, secondary, urban and farm-to-market roads.

First of all, notes a report by Committee Secretary Arthur C. Butler, it is generally agreed that the American people, as a whole, took a greater interest in road and street problems during the past year than in any one year of the last two decades. This interest is reflected in the newspaper, national magazine and other material that has been written and distributed to millions. A large segment of the American public and trade press is acutely aware of the highway crisis and has done a remarkable job in alerting the nation to the need for action. The "PAR" movement and what it is trying to do has had the continuing cooperation and support of many segments of the great public information services, as well as industry, and will continue to work very closely with them.

29 States Cooperate

The PAR idea is predicated on the sound principle that actual improvements of all roads—primary, secondary, urban, farm-to-market and city streets—must be planned and carried forward largely within the states. From the very inception of PAR it

was realized that no movement which was purely national in character could get the desired results. That is why the greatest possible stress has been placed upon the initiation of PAR movements within each of the individual states where necessary.

During the past year, PAR activity has been started in 29 states and one metropolitan area, Philadelphia. In 10 of these states preliminary steps toward innovating the program in some form have been taken. Six other states are about to embark on a campaign while two states are working actively for PAR objectives. The remaining 11 states where the PAR movement has been undertaken actively are: Arkansas, Colorado, Connecticut, Idaho, Kansas, Montana, Oklahoma, Tennessee, Washington, West Virginia and Wyoming.

West Virginia is the most recent of the states to initiate action, under the sponsorship of the West Virginia Highway Users Conference. In an enthusiastic meeting, attended by representatives of organizations both within and outside the State Conference, PAR for West Virginia got underway. While the PAR movement has taken various forms in other states, the West Virginia group felt that a PAR committee should be organized for the purpose of studying and drawing up a program for highway improvement based upon PAR objectives.

Roy E. Jorgensen, Engineering Counsel for the National Highway Users Conference, explained to the West Virginia group how sufficiency ratings, strongly advocated by PAR, are being used in several states. The sufficiency rating system, he said, is flexible because it not only documents highway needs on the basis of structure, service and safety, but also takes into consideration other factors which influence highway construction, such as acquiring rights-of-way.

PAR and the American public's interest in highway improvement matters have come a long way in a year and the outlook for continued progress is extremely encouraging.

Connecticut envisions a \$400 million road program

A ten-year program of road building that would cost \$400,000,000 has been recommended to the state assembly by the Connecticut state highway department. The Roads, Rivers and Bridges committee of the assembly has endorsed this plan, which would provide expressways and thruways criss-crossing the state as pictured in the accompanying sketch.

A bond issue of \$200,000,000 has already been endorsed by this committee to begin the program. The approved portion of the job would include the Fairfield County Thruway from Greenwich to West Haven, at a cost of some \$135,000,000, and a continuation of this artery through east-

ern Connecticut to connect with Route 6 in Rhode Island, at an additional cost of \$65,000,000.

In the ten-year program Albert Hill, state highway commissioner has asked for the inclusion of twelve super-roads in the network. All thru-ways would be designated as toll roads.

22 states consider fuel tax increases

Proposed legislation to increase motor fuel tax rates has been introduced in 22 states, a survey made by the National Highway Users Conference reveals. Measures are still pending in 13 states but have been finally disposed of in 9 others, as of March 18.

A North Dakota bill providing for a 2c tax hike on gasoline, and use fuel already has been enacted. Other fuel tax increases being considered include:

	Gasoline	Use Fuel (Diesel, etc.)
California	1c, 1½c	1½c, 4½c
Colorado	2c	2c
Connecticut	1c	1c
Iowa	1c, 2c	None
Kansas	2c	None
Maryland	1c	None
Massachusetts	2c	2c
Minnesota	2c	3c
Nebraska	1c	None
Ohio	1c	1c, 2½c, 3¼c
Oklahoma	.04 of 1c	None
Texas	1c	6c, 7½c
Wisconsin	1½c	None

In Utah, two legislative enactments providing for a 1c increase in the gasoline tax have been vetoed. Fuel tax increases failed of enactment in Idaho, Indiana, Montana, New Mexico, South Dakota, Washington and West Virginia upon adjournment of said legislatures.

The Kansas and Minnesota proposed gasoline tax increases would automatically become effective within varying periods of time after the repeal of the Federal gasoline tax.

In most instances, proceeds from the new levies would be earmarked for highway purposes. However, the Massachusetts proposal would allocate its revenue to a proposed Liability Insurance Fund. One Maryland bill would use revenues from a 1c gasoline tax increase for the payment of a veterans' bonus.

Temporary tax increases are due to expire this year in five states. Unless extended, these state rates will be reduced as follows: Oklahoma 6.58c to 5.58c and Pennsylvania 5c to 3c (on May 31); Colorado 6c to 4c, Kansas 5c to 4c and Nevada 5½c to 4c (June 30). A proposal to extend the tax has passed the lower House in Oklahoma. Bills have also been introduced in Colorado, Kansas and Nevada to continue the temporary rate.

Tax decreases of 2c on both gasoline and use fuel are being considered

in Colorado and Massachusetts, while reductions of 1c and 2c per gallon of gasoline have been proposed in Minnesota and Texas, respectively.



★ Ethel Birchland

Ethel Birchland retires from Road Builders Assn.

Ethel A. Birchland, well known to many highway engineers and contractors as a long-time employee of the American Road Builders Association, has retired after 43 years continuous service with the Association. She was assistant secretary, and had served in various other capacities, including participation in the carrying out of the annual conventions.

Miss Birchland's many friends wish her well as she goes to her home in Weston, Connecticut, where she expects to pursue writing and hobby interests.

New developments in airborne equipment reported

With the advent of improved heavy drop techniques, development of airborne construction equipment has entered a second phase at the Engineer Research and Development Laboratories, Fort Belvoir, Virginia. Such equipment is now being adapted for air drop as well as for air landed operations.

In the development of airborne construction equipment which has been continuing at the laboratories since 1947, maximum critical limitations have been established at 16,000 lb. and an 8 ft. by 8 ft. cross section. Equipment destined for air drop plus its shock absorbing modifications must remain within these weights and size limitations.

For air drop the laboratories have reduced the allowable airborne height by approximately 18 inches. This is to provide space for special shock absorbing gear under the equipment, a pallet mounting, and multiple roller conveyors which facilitate evacuation from the airplane. Special lifting eyes suitable for parachute suspension points and tie-down provisions are added.

Investigations have disclosed that nearly all the items in the current construction equipment airborne

family will require only minor modifications to meet the new criteria.

A 100-hp. airborne tractor dozer, a 6-yd. scraper, a 14,500-lb. motor grader, tractor saws, towed scrapers and crawler and rubber tired tractors with bucket loaders have been dropped without mishap. Other items to be drop-tested include air-compressors, cranes, rock crushers and rollers.

Prizes offered for best highway reports

Annual awards to highway departments preparing the best yearly reports to the public on the status of road systems under their jurisdiction, will be presented by the National Highway Users Conference.

As explained by Conference chairman Albert Bradley, "good business practices are applicable to highways. Clear, concise annual reports to the people on the current condition and planned improvement of their primary, secondary, urban and farm-to-market roads should be a basic step in overcoming America's highway emergency.

"Simplified, understandable and informative annual reports by state and local highway departments will advance the understanding of 'the man in the street' who, after all, must do the talking if we are to get the support for sound highway programming for all classes of roads which we so vitally need," Mr. Bradley declared.

Low accident rate for Pennsy. road workers

Continuing the safety record, which in 1951 won award of a National Safety council plaque, the Pennsylvania Department of Highways reported highway workers in twenty-five counties escaped without a single lost-time accident in 1952. Fred E. Goodhart is safety engineer.

In the other counties accidents were reduced for a new state-wide frequency rate per million man-hours worked of 4.3. Last year's mark was 6.0 and in 1950 it was 7.5. The total number of lost-time accidents in 1952 was 134 against 190 the year preceding.

In state road equipment operation a total of 34,462,726 miles were driven for a frequency rate of 0.66.

The Philadelphia district continued to lead in absence of lost-time accidents, rounding out thirteen years. Several other county maintenance districts have achieved no-accident periods from one to four years.

• Gross revenue of \$80,930,097 is reported by Merritt-Chapman & Scott, heavy construction contractors, for 1952. Net profit was \$1,496,320. About \$118,000,000 of construction was on the company's books at the beginning of 1953.

Mr. Highway

To many of us in highway work it is hard to realize that a fellow named MacDonald is no longer guiding the helm in Washington. Thomas H. MacDonald has retired at age 72 after serving 34 years, first as Chief, then as Commissioner of the Bureau of Public Roads. His many friends wish him well as he departs. His immediate address is College Station, Texas, where he is a consultant on a research institute being set up by Texas A & M College.

MacDonald is certainly the No. 1 highway engineering figure of our times. Few men in contemporary public life have left greater tangible monuments, few have left a greater impress on the Nation's economic and social life.

Shortly before leaving Washington the Commissioner extemporized for Roads and Streets on some of the problems he considers most vital to the future of highways. In this informal interview he referred to one of the themes of his Centennial address in Chicago last September. "The highway engineer's problem," he reiterated, "is that he be permitted to accomplish the things he knows how to do. Before he can plan or build better highways, legislators must provide the administrative machinery and the source of funds."

Engineer's Chief Problem

Here, briefly stated, is a secret of MacDonald's rather astonishing career. Throughout his public life he sought—and obtained—the confidence and cooperation of legislative bodies. His early success as a leader in Iowa highway affairs brought him to Washington, where he won the respect of Congressional leaders. His counsel has helped establish and maintain the sound, far-seeing Federal-state relationship under which the Nation has emerged from mud road days to the present relatively advanced state of highway network development.

"A legislative body has a permanent existence," he emphasized. "Individual members come and go but these bodies remain. It is important to highway advancement that the legislatures have a continuing rather than sporadic interest in highway affairs. Highway administrators, hence, must maintain a continuous, fixed purpose of supplying full infor-

mation on highway needs to their law makers."

Under MacDonald's guidance the Bureau of Public Roads has set an example by providing facts to the National Congress. This has been done with such success that Washington leaders came to look to him for straight answers, and more often than not acted on his well-tempered recommendations.

Few of us realize how many times in the past three decades the Federal-aid highway program was in danger of being derailed by radicals, theorists, agents of selfish groups or well meaning blunderers. But the sound tenets of the Federal-aid acts of 1916 and 1921 have stayed on the books. Lest we forget, it was these acts which provided the first major federal appropriation on a state matching basis. It was these acts which encouraged the establishment of modern highway departments in the states, which fostered the defining of a main road system, and spurred the adoption of progressive design, construction and maintenance standards for the federal-aid system.

It was then, too, that the principle of state control was established. MacDonald and the Bureau, as a policy, have avoided excessive federal encroachment on state highway affairs. The Bureau is conspicuous for an almost complete absence of federal specifications, be it noted; it has worked through committees of the

American Association of State Highway Officials to set up engineering guides.

"This is the way the federal and state governments should work together on road problems," said the retiring Commissioner. "To a large extent this procedure disposes of partisan questions."

Meddling with Location

He next touched on the problem of highway location. "I am conscious," he said, "of a growing tendency for selfish groups to exploit the traffic stream. It is time to raise the question whether the solving of traffic problems, with their questions of safety, convenience and economy should be subjugated to exploitation and handicapped by individuals."

"Looking at the other side of the location question, proof is emerging that nearly everyone gains by soundly located arterial facilities, with their access roads and service roads," he noted.

The present high activity in toll roads and bridges the retiring Commissioner sees as but a phase in the struggle to fit highway transportation into modern life. The toll mileage will always be but a minor part of the entire road network, and toll roads will have little effect on the long-range development of this network, "except possibly to retard legislation desirable for proceeding with the whole road problem," to quote his words. "Patterns in automobile use have changed little in the past quarter-century. While there are more cars, more freely used, the auto still is basically a local vehicle, used daily in the movement of people in and about their communities."

The long-distance utilization of highways is centering chiefly in the mushrooming truck transportation, observed MacDonald. He voiced the hope that sound balance will eventually be achieved between rail and highway transport. "Highway transport, while more flexible, involves high priced fuels and small tonnages per unit," he explained. Building costly long-distance highways under the spur of truck transport may not always result in the most economic service, as compared with such possible developments as the inter-regional



★ Thomas H. MacDonald

Examples of MacDonald's Basic Thinking on Highways

(Extracts from papers given at various highway meetings during his career)

The use of the principal highways is so extensive that the people pay for adequate highways whether they have them or not, and they pay less if they have them than if they have not.

—Roanoke, Va., January, 1923

* * *

If the highway program . . . entails an expenditure greater than can be met with current funds without diverting money from other necessary purposes, the only recourse is to issue bonds, for I will remind you again, that to fail to prosecute the work of highway improvement as rapidly as physical limitations will permit, is merely to shoulder the inescapable expense in the form of greater operating costs for vehicles, a form in which it will be greater than if it is assumed as a road construction cost.

—Roanoke, Va., January, 1923

* * *

The Federal Government through Federal aid may, and we believe does, occupy an important and essential position in correlating the major systems between States and in assisting to build at a reasonable rate a coordinated national system of highways. . . . But the key to the whole administrative structure, considering highways from the basis of a national system, lies in the State highway departments.

—Pittsburgh, Pa., November 17, 1930

* * *

There should be the conception and formulation of a composite plan for the development of all highways, regardless of their present legal classification or condition, and an estimate of the probable cost. . . . On the basis of such information intelligently consolidated, there need be no hesitation in undertaking the broadened

highway program with faith that the growth of population, the promotion of the safety and economy of highway transportation, and the enlarged social and recreational benefits to be secured, will justify and maintain the cost if the plan is laid with intelligence and faith in the future.

—Washington, D. C., January 22, 1935

* * *

It is the duty of State officials to safeguard the great investment in highways by prohibiting the movement of loads that may damage or destroy the highway structures. The problem is to establish regulations governing the operation of motor vehicles that will allow truck operators the greatest latitude possible consistent with the ability of highway pavements and highway bridges to carry the loads without distress.

—Washington, D. C., May 5, 1942

* * *

It is a good example of living in a "fool's paradise" to substitute costly maintenance for needed capital improvements.

—San Antonio, Texas, October 11, 1949

* * *

The most important problem of all at State, Federal or local level, is a larger force of trained engineers and technicians who know that they have a stable career in the highway improvement field. More adequate salaries, opportunities for advancement through in-training courses, retirement plans, are among the necessities to attract men to highway work.

—San Antonio, Texas, October 11, 1949

* * *

Whether new routes will retain their capacity for serving traffic

safely and efficiently will depend on their design. Too often highways . . . gradually deteriorate until replacement is inevitable . . . due to obsolescence. . . . The true cause (of obsolescence) is the increasing interference from the uncontrolled roadsides, which reduces capacity and increases accident potential from the day the highway is opened to traffic. If the highway is designed with complete control of access it will . . . serve traffic indefinitely.

—Boston, Mass., March 1, 1949

* * *

If our highway plant is to be kept operating with a reasonable degree of efficiency, we must set our sights not only on next year's traffic needs but on traffic requirements that may develop in the next 10 or more years.

—Cincinnati, Ohio, March 6, 1950

* * *

The highway engineer must recognize that the field of highway engineering is not confined to the construction and maintenance of the physical structure of the highway. He must recognize more fully that his responsibility is related broadly to the development of highway transportation generally—that the purpose of highway engineering is to move people and goods quickly and safely.

—Chicago, Ill., September 5, 1952

* * *

To supply our law-makers with full data from continuous engineering and economic surveys and studies is the most important single duty we have as highway officials.

—Kansas City, Mo., December 10, 1952

rail transport of loaded truck-trailer bodies and other cooperative effort with the railroads. Railroad companies must remain in strong economic health for the movement of the nation's heavy long-distance freight.

Perhaps closest to MacDonald's heart as he leaves Washington is the human side of highway engineering. The Bureau began its Federal-aid

work a third of a century ago with a group of able young engineers, many of whom have stayed on to make good careers. "From the start," he reminisced, "we had some kind of a training program. Deputy Commissioner Fairbank, for example, was the first trainee, coming fresh from Cornell to achieve a distinguished career. The Bureau has had few leaders who didn't come in through the training

route and work their way up." The present more formalized training program has been successful in attracting well qualified young engineers.

"Mr. Highway," as the Commissioner came to be known, left as his legacy an example of leadership, personal integrity and adherence to sound principles. His successor indeed has big shoes to fill.

—Harold J. McKeever

MacDonald's Career Outlined

THOMAS H. MACDONALD, who retired April 1, directed the work of the Federal road building organization from 1919, first as Chief of the Bureau of Public Roads, and since 1939 as Commissioner of Public Roads (the organization, now the Bureau of Public Roads, Department of Commerce). He was responsible for administration of Federal highway funds since shortly after the beginning of Federal participation in highway matters on a national scale. He has greatly influenced the formulation of National highway policy and given skilled direction to the plan of Federal-State cooperation in highway improvement.

Mr. MacDonald was born in 1881, near Leadville, Colo., but grew up in Iowa. After studying one year at Iowa State Teachers' College, he entered Iowa State College, receiving the degree Bachelor of Civil Engineering in 1904.

While an undergraduate and at a time when there was little interest in highways, he showed an interest in highway engineering that was to guide his entire life. At the suggestion of Dean Marston, a noted teacher and leader in engineering, he undertook for his thesis a study of the highway needs of farmers and the force required to pull a wagon over different types of road.

First Opportunity

In 1904 the Iowa Legislature appointed the Iowa State College to

make investigations of highways and methods for their improvement. Mr. MacDonald was employed as assistant professor of civil engineering in charge of road investigations, and in 1907 was made State highway engineer.

The Iowa highway law was revised in 1913, providing a three-man commission having power to coordinate road building throughout the State. Mr. MacDonald was appointed chief engineer. Before the end of his 15-year connection with the commission, Iowa has become one of the first States in the Middle West to establish a state-wide system of main roads, and about a third of the designated 6,400-mile network had been permanently graded, drained, and bridged. The next step—hard-surfacing the system—had been planned and was about to get under way when Mr. MacDonald was called to Washington to become chief of the Bureau of Public Roads. He remained at the helm of the Federal Government's road-building agency since that time.

At the time of his appointment to the Bureau, in 1919, plans were being developed for administering the Federal-aid Road Act of 1916 which marks the beginning of Federal assistance to the States in highway improvement.

Saw Great Changes

He immediately sought the advice and assistance of State officials, acting through the American Association of State Highway Officials, in developing Federal-aid procedure and has consistently followed this practice in the development of highway policies, specifications and standards. When he took office the plan of Federal-State

cooperation was an untried venture. It has been successful beyond all expectations. When it was initiated there were no surfaced roads interconnecting the large cities of the country. Industries were located alongside the rail terminals. The farmer was isolated from city life. Federal assistance to the States launched them upon programs that have made a complete change in all these conditions.

F. A. System Evolved

The Federal-aid highway system was authorized in 1921 and the Bureau began its work of bringing the States into agreement on a coordinated system to serve the entire country. Differing views as to where routes should cross State lines produced difficult problems but all were solved.

In connection with designation of the Federal-aid system, inquiry was made of the War Department as to which of the highways were considered to be the principal strategic importance in event of war. It was desired to include those roads of greatest importance to national defense in the system being selected. The War Department submitted a map approved by General Pershing. The routes shown on the map were included in the system, and were improved in the following years. On numerous other occasions Mr. MacDonald has requested the advice of defense officials and has been guided by their recommendations.

In 1924 the Bureau placed special emphasis on elimination of the hazard at railroad grade crossings and urged the States to adopt grade-crossing elimination programs. Thousands of



★ Thos. H. MacDonald seen with notables in highway engineering, at an early meeting of state highway officials. How many of these faces do you recognize? (Photo courtesy U. S. Bureau of Public Roads)

A "MOVING" STORY

IN PICTURES

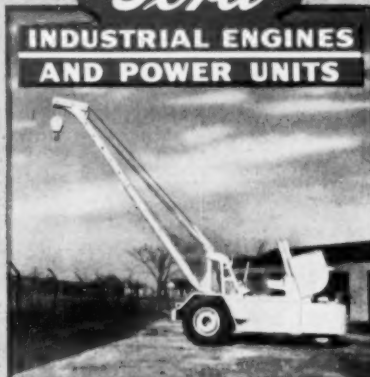
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1/ THE EASY WAY . . .

. . . is to design a few basic machines, and then build up a line of additional models by adding extra counterweight, speeding up the engine, and hanging different size dippers on each.



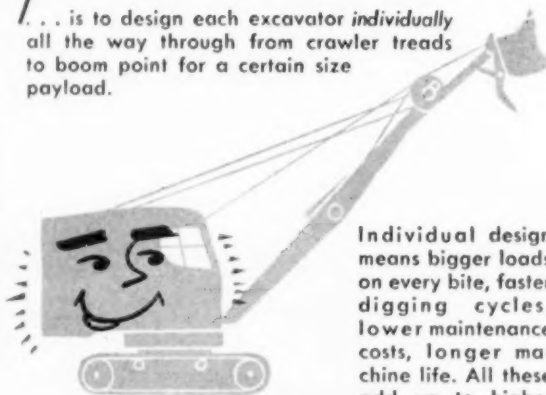
Some of these machines will carry dippers too small. Output will be reduced, power wasted.



Other machines with dippers too large and counterweight too heavy will sweat and strain from overwork.

2/ THE BUCYRUS-ERIE WAY

. . . is to design each excavator *individually* all the way through from crawler treads to boom point for a certain size payload.



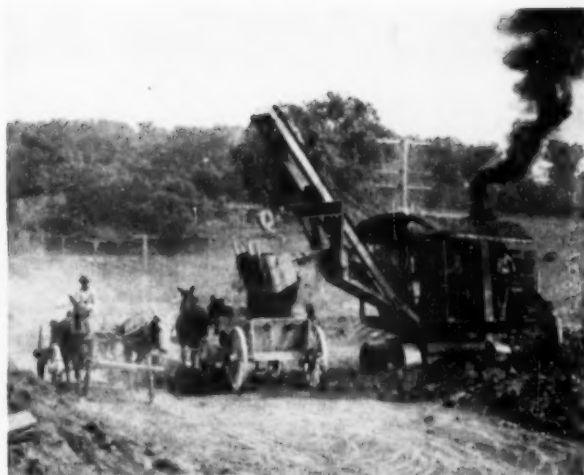
Individual design means bigger loads on every bite, faster digging cycles, lower maintenance costs, longer machine life. All these add up to higher overall output, lower overall costs. Compare *individually designed* Bucyrus-Eries with excavators in any other line before you buy. Ask your Bucyrus-Erie distributor to give you complete details on how individual design means bigger output for you.

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★ Retiring Commissioner MacDonald's 34-year tenure in Washington, plus earlier years in Iowa, spanned the dramatic transition from horse-and-buggy, mud-road days to the Mid-century's new and more complex highway problems. (Photos courtesy U. S. Bureau of Public Roads)

crossings have been eliminated in the Federal-aid program.

Mr. MacDonald was one of the small group instrumental in establishing the Highway Research Board of the National Research Council in 1919. He has served as ex officio member of the executive committee of the Board since its first meeting in 1923, and has been an active participant in the broad research program of the Board that has had great impact on highway development.

In 1924 Mr. MacDonald was designated Chairman of the Joint Board on Interstate Highways appointed by the Secretary of Agriculture at the request of the AASHO. The Board was composed of 3 Federal and 21 State representatives. Through a series of national and regional meetings, agreement of all the States was obtained on routes to comprise the U. S. numbered system of highways, thereby eliminating the great confusion that had previously existed in route designation, mapping, and marking of routes. The Board also developed the

system of standard informational, warning, and danger signs now in use on all highways throughout the country. The Board eliminated the chaos and confusion that had existed in highway designation and marking without the aid of legislation or compulsory action. Its recommendations are now accepted by all highway agencies.

An early policy of the Bureau with regard to standards for Federal-aid highway construction has been highly successful. Instead of announcing design standards, specifications, and administrative and technical processes to be used on Federal-aid work, the Bureau sought to have these developed by AASHO committees. The Bureau has membership on all committees, each of which is composed of men of outstanding ability in the particular field. The standards produced are now voluntarily applied by practically all highway agencies.

Administration of Federal aid to the States has been the primary function of the Bureau, but it has numer-

ous other duties. These include supervision of construction of roads in National forests, National parks, and other Federal areas and of repair and reconstruction of highways damaged by major floods. During the War the Bureau enlisted the aid of State highway departments in the rapid construction of highways to serve defense establishments (also helping to build the Alaska Highway).

Prolific Writer

He has been a prolific writer on all phases of highway improvement. In recent years his papers have been directed toward the widespread highway deficiencies and the urgency of their correction.

Mr. MacDonald has received numerous honorary awards during his career. He was awarded the honorary degree Doctor of Engineering and the Marston Medal for achievement in engineering by Iowa State College; hold the Cross of the Legion of Honor from the Government of France; invested by the King of Norway as Knight of the First Class of the Order of St. Olav; appointed foreign member of Masarykova Akademie Pace by the prewar Government of Czechoslovakia; awarded Medal of Merit for outstanding service during World War II. He has represented the United States and headed delegations at numerous foreign conferences and gatherings. He is honorary member of the American Society of Civil Engineers and the Institute of Traffic Engineers; member Executive Committee of American Association of State Highway Officials; Executive Committee, Highway Research Board; Chairman, Committee on Program and Planning of the President's Highway Safety Conference; member of the National Safety Council, American Planning and Civic Association, and Beta Theta Pi and Tau Beta Pi.

His Experience Has Been International

The work under Mr. MacDonald's direction was not limited to the United States. For a number of years the Bureau has supervised the expenditure of funds authorized to aid the countries of Central America in building the Inter-American Highway. Under various legislative authorizations it has furnished staffs of engineers to aid the governments of the Philippines, Turkey, Ethiopia, Bolivia, Liberia, and other countries in building modern highways. Mr. MacDonald has been a strong advocate of high-

way improvement as a necessity in the solution of economic difficulties throughout the world. He regards the progress being made in countries such as Turkey and Ethiopia, as confirmation of this belief. His personal interest in furthering highway improvement in countries that suffer from lack of transport has resulted in many engineers of other countries coming to the United States and obtaining instruction in highway methods. The assistance obtained from State highway departments has been an important feature in training visitors.

Contractors See Big Future

A.G.C. convention at Miami broke all attendance records, as members met to consider industry problems and opportunities. Emphasis placed on importance of accelerating highway programs, and on maintaining a strong federal road agency with increased federal aid as a sound national policy.

By Harold J. McKeever

Editor of Roads and Streets

THE construction industry, having climbed steadily during fifteen years to an annual volume of \$45 billion forecast for this year, should look to even greater volumes in an expanding America. So stated president A. S. Horner at the opening session at Miami, Florida, where the Associated General Contractors of America convened March 23-26 for their 34th annual convention.

The previous peak year in dollar volume by the industry was in 1952, when \$43,300,000,000 was spent for construction. "Farther into the future," said Horner, "studies made indicate that a dynamic United States will require something like \$60,000,000,000 annually in new construction to provide the physical facilities it will need.

The four-day convention was attended by a record breaking 1,570 registered delegates. The A.G.C., it was noted, today has over 6200 members, representing 122 chapters, whose companies perform over 80 percent of the Nation's contract construction as well as a large volume of work overseas.

Also emphasizing the continued need for a high construction volume, Under Secretary of Commerce Walter Williams, speaking at Miami, warned contractors against whispered talk of business slump. "The innumerable

wants and demands of a nation comprising 158,000,000 people are such that a thorough-going sales promotion campaign should readily enough be able to pick up any business slack," he said. Development in international trade should also help keep American business operating at full capacity, he further noted.

Speed Roadbuilding

Williams was one of several speakers who gave particular emphasis on the need for speeding road construction. As a newly appointed cabinet aide in the department which contains the U.S. Bureau of Public Roads, his remarks indicate a friend in high place for progressive highway policies. He described traffic conditions of the Nation as "intolerable," and said that the next 10 years would bring another 40 percent increase in traffic. Saying that not enough is being done about roads, he pointed out that half the total Commerce Department budget goes to federal road aid. Williams advocated toll roads where feasible as a means of getting the road user to pay a more direct portion of road costs.

Set Three Goals

General contractors have set their sights on the accomplishment of three "fundamental" programs this year, said H. E. Foreman, A.G.C.'s managing director, in his annual report. These goals are: (1) enactment of federal legislation assuring the right

of judicial review of disputes, arising from decision of government departments on federal construction or other procurement contracts; (2) the defeat of attempts to pass legislation which would require general contractors on federal projects to name proposed subcontractors and their bid amounts; (3) and to be all possible assistance to Congress as it considers amendments to the Taft-Hartley act, to the end that amendments for the construction industry may be sound.

On the first point, noted Mr. Foreman, A.G.C. representatives have since the opening of this session of Congress, consulted with leaders of the Senate and House Judiciary Committees to encourage the early passage of a bill granting the right of judicial review of disputes due to departmental decision on federal construction. Bills are pending on this question. Legislation is considered imperative to offset a Supreme Court upholding the finality of decisions of contracting officers.

Army and Navy leaders were included on the program, whose audience was concerned with the recent holding up of military construction during an evaluation study by the new administration. Capt. A. D. Hunter, deputy chief, Bureau of Yards and Docks, told of the Navy's construction program which totaled \$1,249,000,000 in work completed or under contract in the year ending March 1, 1953.

Defense Problems

The need to plan construction to meet global defense requirements was emphasized by Maj. Gen. Samuel D. Sturgis, Jr., Chief of Army Engineers. "If anything, the jobs we are doing and will be called on to do will exceed the World War II requirements for ingenuity and careful planning," he said. "The military construction program today is necessarily based on decisions subject to changes generated by the continual shifts and maneuvers of global strategy."

He went on to note that we are given wartime conditions and peacetime rules in planning construction. As a result, the Corps of Engineers or the contractor is often criticized before all the facts are known. The General went on to defend vigorously the achievement of the Corps and their contractors in Morocco, reviewing the history of that much-criticized airbase project in the light of difficulties beyond the scope of the Corps. "This job, plagued with shifting site problems, funding difficulties, and the constant pressure of speed, and located at remote sites in a backward area, is one of the most dramatic construction jobs ever carried out," he said. "His-



★ Arthur S. Horner, retiring president of A.G.C.; Walter Williams, Under Secretary of Commerce; C. S. Proctor, past-president of A.S.C.E.; and C. P. Street, incoming president of A.G.C. Williams and Proctor were among Miami convention speakers

tory may someday determine how important the early availability of these fields, as achieved, was to the security of our country."

Keen Bidding Competition

Contractors are in a period of abundant work characterized by intense competition, sharp bidding and lower prices, according to a survey by A.G.C. reported at Miami. This condition was ushered in by the removal of government controls, and by the general availability of materials. Material prices are expected to be relatively stable, with increases in some lines. There is evidence that demands for wage raises and new fringe benefits by labor will be resisted by employers, this report said.

Greater volume of work is in sight for the next six months, than for a comparable period of 1952, although paradoxically 93 percent of members reporting said that competition has risen sharply. Some members report the most severe bidding competition since 1940. The explanation given is that many contractors, heretofore out of the market because of uncertainties caused by controls, came back in when controls were lifted. Contractors were being encouraged to bid, A.G.C. spokesmen said, by substantial assurance that they could now proceed on job schedules at a pace set by themselves for maximum efficiency and economy. They were apparently bidding in recent months on many jobs simultaneously, it is believed, and "loading up" on projects which they were able to complete in rapid-fire order with newly developed techniques and equipment.

"Highway and heavy engineering projects especially lend themselves to mechanization on a large scale," this report added. "The introduction of new machines in these fields in recent years—as well as new speed techniques, developed in other branches of construction during the war under military pressure—have greatly increased the capacity of the industry."

This survey report indicates that the greatest increase ahead in construction will be in roads, with 86 percent of the responding companies stating that road work would be equal to or greater in volume compared with 1952. Sixty-two per cent said that highway construction volume would be greater.

Highway Division Meeting

Highway contractors, both as businessmen and as citizens, are keenly alive to many aspects of the highway problem, and the all-morning session of the A.G.C. Highway Division brought many questions and some answers. A. N. Carter's annual report as division manager started the ball rolling, this report revealing that a continued rise on roadbuilding contract volume is in prospect. Contracts are ahead for 1953, in line with the 9 per cent rise predicted early in the winter by the Commerce and Labor departments. One prediction indicated



★ At the A.G.C. Highway Division session: Col. M. Clare Miller, McPherson, Kansas, newly-elected division vice-chairman; P. M. Thornton, Hancock, Mich., new chairman; Fred W. Heldenfels, Jr., Corpus Christi, Texas, retiring chairman; and Arch N. Carter, highway division manager with A.G.C. Washington staff

a rise of as high as 25 per cent, due partly to heavy turnpike and bridge awards. Bridge awards alone are expected to reach \$500 million for 1953, or 21 per cent over last year.

The use of contractors in road repair and maintenance by some states was noted in Carter's report. An A.G.C. program is aimed at stimulating more of such work.

Highway financing evoked lively discussion, with particular interest in toll road policies. Most A.G.C. chapters, it was indicated, have a hands-off policy on toll roads, taking no position either for or against them. Individual opinion expressed from the floor by delegates ranged from for to against them. One Indiana spokesman voiced particular concern over the effect that toll projects will have on the continuing road program of the state, "where our bread and butter comes from to help us raise our sons," as one put it. There is concern that some of the toll projects proposed are unsound; despite the fact that state credit may not be initially involved, nevertheless the state would someday have to divert road funds to bail out the undertaking if it didn't pay off.

Turnpikes Create "Diversion"

An Ohio man brought out a serious and heretofore little publicized problem, "that all should be warned against." In Ohio, he said, the \$347 million dollar turnpike just being initiated has drained off state road funds previously promised for other needed use. Over \$6,000,000 will be needed to build access or connecting roads to the Turnpike that are outside of the Turnpike's domain and are not provided for in its financing. Especially in the eastern corner of Ohio, the state has had to spend money already to provide temporarily for traffic spewed off the Pennsylvania turnpike onto local roads. Costly provisions required to handle traffic related to new toll roads often are only temporary in value.

Added to Ohio's troubles is the large access road program required for the region around the Atomic Energy project on the Ohio River. Here again,

costly road facilities must be built by the state, in this case to serve a temporary traffic of construction workers and families. Meantime, expressway aid in Ohio's cities will have to wait, and other serious dislocation of the road program is involved, to the detriment of the public. The recommendation was made that turnpike financing on projects now in the planning stage be sufficient to include aid on access or linking roads.

"Only about one-third of the turnpikes proposed have a chance to pay off," ventured one contractor. "Of course we all want jobs, and will be glad to have them, but a temporary flurry of turnpike work is a small matter compared with a steady volume of road jobs over a period of years coming from an undisturbed state program."

The Kansas turnpike proposal was declared questionable by one individual. The West Virginia turnpike also was cited as an example of a doubtful venture, the originally conceived superhighway turning out to be a 2-lane road extending only part of the planned distance and nevertheless costing bondholders a big sum. Contractors present were warned against excessive optimism toward turnpike proposals in their respective states. "Wholesale thinking on toll roads is dangerous," they were told.

A California contractor spoke of good progress with freeways and other roads in his state, where he believes the public "will not go for toll roads" but is sold on the state-wide program.

Another aspect of toll roads was touched on, namely the setting up of separate authorities to build and manage them. The contractors, one man noted, would prefer to see toll roads built by the state highway department. There is little evidence of harmony and cooperation between some existing turnpike authorities and the highway departments, he noted. For the public good, a unification is needed in road planning of a state. Highway departments need to be built up and strengthened, not encroached on.

At the highway session a brief re-

What the Contractors Were Most Concerned About

*Resolutions adopted at the 34th A.G.C. annual convention
Miami, Florida, March 23-26, 1953*

Worker Safety

- The A.G.C. again recommends that members continue to improve their planned programs of job accident prevention.

- Expresses vigorous opposition to legislation by Congress for the supervision of industrial safety regulations, on other than federally-financed projects; such legislation is an unwarranted assumption of authority vested in the states. The construction industry can carry out safety measures more effectively on a voluntary basis.

Defense Construction

- During periods of unsettled international conditions, the agencies which have mobilized themselves and contracting organizations for necessary defense construction, or are in a position to do so promptly, should continue the administration of federal and federal-aid construction programs.

During the defense program prior to World War II, the war period, and the subsequent defense program, the construction industry has mobilized for fast and economical construction of defense projects. The increasing promptness and effectiveness with which this mobilization has become possible depends (1) on familiarity of government agencies with the tasks for which they are responsible; (2) and on familiarity of contracting organizations with policies and personnel of the agencies. Much of this familiarity is gained through execution of civilian construction work.

State Labor Laws

- Expresses its opposition to any federal law which would impair or supercede labor legislation by the several states.

Prevailing Wage Scales

- In order to conserve public funds, to combat inflationary pressures, and to avoid disruption of conditions in the construction industry, the association again urges that, in pre-determining the minimum wages for federal construction projects, the Secretary of Labor: (1) Maintain the historic differentials recognized between building construction and highway and heavy construction; (2) Give realistic consideration to locality wage scales.

- Federal agencies, undertaking construction work with their own forces or by contract, should conform to wage scales prevailing in the community.

Wage Stabilization

- Endorses the President in suspending wage, price controls, and expresses the conviction that the best interests of the nation's economy are served by the normal negotiations of management and labor, free as possible from governmental intervention and regulation.

- Wages in construction have generally increased commensurate with increases in the cost of living and productivity. The Association recommends that members and chapters accept their responsibilities to cooper-

ate by avoiding unwarranted increases in wages or fringe benefits which are detrimental to the national welfare.

Industry Relationships

- Expresses opposition to S. 848, and similar proposals for a revised federal contract procedure, for the reasons that such legislation would cause unnecessary government regulation of business relationships in the construction industry, and would tend to increase the cost of public works construction.

The Association continues to offer cooperation to solve, within the industry, such problems of the relationships of general contractors with other segments of the industry as may arise.

Right of Judicial Review

- Reaffirms the resolution adopted at its previous convention, as follows:

The majority decision of the Supreme Court of the United States in the *Wunderlich* case, decided November 26, 1951, interpreting the "disputes clause" (Article 15) of the Standard Form of Government Contract to mean that the determination of a department head is final, and that there can be no recourse to the courts in disputes involving questions of fact unless fraud on the part of the government is alleged and proved, makes legislation mandatory by the Congress of the United States to prevent the destruction of the competitive contract method now prevailing throughout the construction industry.

The dissenting opinions recognize

port was made by the AASHO-AGC joint committee, which met at Miami for its third meeting held this year. The committee took up means of stimulating interest in highway careers among engineering students, better pay scales in the highway departments, summer employment of students by contractors, and other aspects of the engineering personnel problem. The engineer shortage was declared to be serious.

Other committee topics aired included: working time allowed contractors on jobs; contract road maintenance work; handling of traffic through projects; variations in proposal guarantees required of bidders; variations in hold-back on partial es-

timates (now ranging from 5 to 15 per cent). The last three topics were turned down as joint committee matters, and left up to individual contractor chapters and highway departments to thresh out at the state level.

Alarm Over Washington

Perhaps the most extended and vigorous discussion at the Highway Division session was over the Washington situation. Declared to be serious was an atmosphere of uncertainty on the future status of the Bureau of Public Roads, threatened with curtailment according to one rumor and to a restriction in its policy making and

administrative functions. A Kansas spokesman said this would be a serious retrogression, endangering the relationships that have fostered the state roadbuilding programs.

The result of this discussion was the proposal of a resolution on federal highway policy, which later emerged as one of the resolutions adopted by the general A.G.C. assembly (see resolution summary in this issue).

Progress in accident prevention by A.G.C. members was praised in the Carter highway division report, as well as by a separate accident prevention report by a committee headed by H. B. Alexander of Harrisburg, Pa. Over two hundred member firms are now supplying A.G.C. with detailed

and warn that the majority decision has wide application as well as a devastating effect, granting the contracting officer the power of life and death over a private business, which permits him to act without fear of further administrative review by an independent government agency not involved in the dispute or judicial review by the courts.

The A.G.C. for the past several years has sought administrative action on the revision of the "disputes clause" (Article 15) to permit judicial review of all questions arising under a contract, all to no avail.

It is the sense of this convention that any decision by a contracting officer or head of a department should be subject to judicial review in order to guarantee that such decision is reasonable, made with due regard to the rights of both the contracting parties, and supported by the evidence upon which such decision was based.

- The Association again urges the National Congress to enact legislation conferring on the courts jurisdiction to review any decision by a contracting officer or head of a department that is unreasonable or unjust, or not supported by substantial evidence; and further, that any provision in any contract with the United States abridging the rights of the parties thereto to court review be declared null and void and that contractors' suits now pending in the courts which have not been finally adjudicated be safeguarded in this legislation.

Administration and Inspection

- To assist in obtaining more uniform procedures for administration of contracts and inspection of projects, which would avoid delays presently encountered on municipal and other types of public works construction,

the Association recommends that the administration and inspection functions be supervised by a competent engineer or by competent engineers in the same engineering department of the governmental unit.

Adequate Pay for Engineers

- Because the salaries paid to municipal and other government construction engineers and many other governmental organizations are not sufficient to maintain adequate staffs, recommends that such engineers administering programs be paid salaries commensurate with their responsibilities and with private industry pay scales.

Construction by Contract

- Because public funds are safeguarded when municipal and other public works projects are executed by contract, public works contracts should be awarded to the lowest responsible bidder after public advertisement. When government agencies undertake construction with their own forces, comprehensive and accurate cost records should be available for public inspection.

Materials and Equipment

- Because maximum efficiency can be secured when complete responsibility for the construction of a project is centralized in a competent general contractor, all materials and equipment to be incorporated into a government project should be furnished by the contractor in accordance with the plans and specifications, except when special circumstances make it feasible for the government agency to furnish them.

Abnormal Hazards

- With the objectives of reducing the number of contingencies which might

confront contracting organizations, and thereby conserving public funds, the A.G.C. recommends that governmental agencies assume the responsibility for damages during the execution of construction operations which are caused by flood, ice, earthquakes, acts of war, riot, other disasters unforeseeable or beyond the control of the contractor.

Highway Financing

- The volume of traffic on the nation's highways, and the hazards of travel, have increased at a greater rate than the construction of safe, adequate facilities. Highway needs extend beyond state borders, and have a direct effect on interstate commerce.

Since the federal government returns for highway construction use only approximately one-quarter of the funds collected in excise and gasoline taxes, it is recommended to the President, the Congress, and to the states that:

1. The federal government assume its proper responsibility by increasing federal-aid returns to the states of not less than the total amount of funds collected in taxes from highway users.
2. The federal-aid highway construction program be administered through present channels.
3. There should be no diversion to other purposes of tax funds collected from highway users by any unit of government.

Publicity on Road Needs

- The Association expresses appreciation to the nation's newspapers, magazines, radio and television stations, to the many manufacturers, and to various other organizations which have been performing the public service or calling attention to the serious need for a more safe and adequate highway system.

accident and safety reports. The Michigan Road Builders Association chapter has led in the percentage of members so cooperating.

Merit awards for worker safety records in the Highway Division, for the year ending Sept. 10, 1952, were made as follows for companies with over 200,000 man-hours exposure:

First: Kaiser Construction Co., West Des Moines, Iowa. Second: Thornton Construction Co., Hancock, Mich. Third: Visintine & Company, Columbus, Ohio.

For companies with less than 200,000 man-hours exposure—First: Pierson Construction Co., Saginaw, Mich. Second: A & A Asphalt Paving Co., Birmingham, Mich. Third: Quinn

Construction Co., Kansas City, Mo.

Best 5-year safety record in the highway division went to George K. Werner & Son, Clay Center, Nebraska. Second: Burrell Construction & Supply Co., New Kensington, Pa. Third: Diesel Oil Sales Co., Seattle, Wash.

Best 10-year safety record—First: A. J. Baltes, Inc., Norwalk, O. Second: Colglazier & Hoff, Inc., San Antonio, Texas. Third: H. B. Zachry, Company, San Antonio.

New president of A.G.C. is C. P. Street, secretary and general manager of McDevitt & Street, building contractors of Charlotte, N. C. He succeeds A. S. Horner, Denver, Colo.

Elected vice-president is John Mac-

Leod, President of Macco Corporation, highway-heavy contractors, Paramount, Calif. Continuing as secretary-treasurer is William Muirhead, of Durham, N. C.

Eighteen national directors elected by A.G.C. include: A. S. MacDonald, Strong & MacDonald, Inc., Tacoma, Wash.; Wayne C. Sutton, Washington Asphalt Co., Seattle; Fred J. Early, Jr., Fred J. Early, Jr. Co., San Francisco; Robert V. Edwards, American Pipe & Construction Co., Los Angeles; David A. Olson, Olson & Hart, Denver; W. Murray Werner, The Werner Co., Shreveport, La.; J. Rutledge Hill, Gifford-Hill & Co., Inc., Dallas, and Wardner Scott, W. A. Lynn Construction Co., Lincoln, Neb.



★ Earle W. Devalon, Denver, hands gavel to successor, Robert Patton, Charlotte, N. C., new chairman of the Secretary and Managers Council of A.G.C. Shown also are Curtis Bell, Corpus Christi, new council secretary, and A. H. Harding, Portland, Ore., vice-chairman. (Not present, William C. Bowden, Pittsburgh, Pa., also vice-chairman)



★ Safety merit award being received by D. R. Agnew, past president, W. Virginia chapter of A.G.C., presented by H. B. Alexander, Harrisburg, Pa., who is chairman of A.G.C. accident prevention committee. At left is W. E. Abbit, chairman of W. Virginia safety committee, and James M. Jar is, new president of the chapter

Also, S. R. Okes, Okes Construction Co., Saint Paul, Minn.; Robert E. O'Connor, J. C. O'Connor & Sons, Inc., Fort Wayne, Ind.; E. J. Wheeler, Frank Messer & Sons, Inc., Cincinnati; W. M. Wheeler, J. A. Jones Construction Co., Atlanta, Ga.; J. L. Ewell, Ewell Engineering & Construction Co., Lakeland, Fla.; V. B. Higgins, V. B. Higgins Co., Greensboro, N. C.; H. B. Alexander, H. B. Alexander & Son, Inc., Harrisburg, Pa.; H. C. Turner, Jr., Turner Construction Co., New York; Charles B. Solomon, Geo. B. H. Macomber Co., Inc., Boston; and W. J. Salter, Stewart & Williams, Inc., Augusta, Maine.

Mr. Street, the new president, is a former chairman and vice chairman of the Association's building contractors' division and chairman of the public relations committee.

Currently a member of the executive, adjustment, governing provisions and public relations committees, he has also served as vice chairman of the ethics and trade practices committee and as a member of the advisory board and finance committee. In 1944 Mr. Street was president of the Carolinas Branch of A.G.C.

Mr. MacLeod, vice-president elect, was born in Scotland in 1893. President of his firm since 1929, he is noted as a builder of roads, dams, ordnance test stations, air bases, supply depots for armed forces, amphibious force installations and industrial facilities, particularly for the oil industry.

Mr. MacLeod's national committee posts in A.G.C. are many. He is chairman of the public relations committee and a member of the executive, finance, labor and progress committees; a director; a member of the Navy Bureau of Yards and Docks specifications committee, and the Construction Industry Manufacturers Association-A.G.C. joint cooperative committee. He was president of the Southern California Chapter in 1941 and headed both the heavy construction and railroad contractors' division of A.G.C. in 1950.

• Toll road proposals previously mentioned in Illinois include a St. Louis-Chicago toll road running east of Route 66 equidistant through such axes as Joliet-Kankakee, Champaign-Bloomington, and Springfield-Decatur.

Rough bridge floors

Pavement roughness at small bridges and what to do about it was the subject of an excellent paper by Philip Keane of the Connecticut State Highway Department at the Boston ARBA meeting. This paper and discussion from the floor indicated that much remains to be done by some agencies to secure proper compaction of bridge approach fills, using the new techniques and equipment now available.

An equally important and much neglected phase of this problem is that of the bridge floor itself. Concrete bridge decks which serve also as pavement are seldom built as accurately as the adjacent pavement—we are referring particularly to small bridges and large culverts that are crossed at highway speeds. Better workmanship by the contractor, better inspection, and better specifications are all indicated as being necessary here.

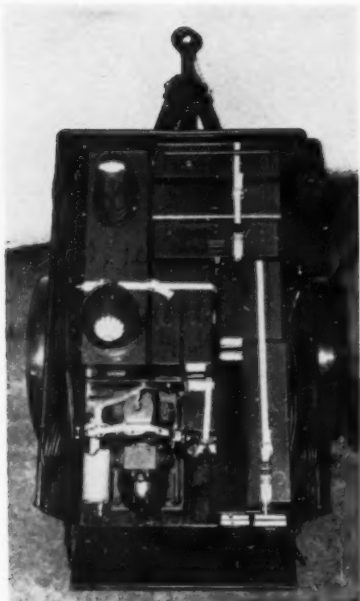
Why shouldn't the finishing of the top of a small concrete bridge be considered as important as the rest of the paving job? The problem seems to be chiefly one of attitudes. Contractors in some states are *expected* to finish their bridge floors to satisfactory tolerance, and do so because they know they must. Elsewhere they "get away" with a roughness that no one would think of permitting on the pavement proper.

The difficulty stems mostly from the fact that small bridge decks, being of short length and extra width, are finished with hand equipment. Where a considerable number of structures are to be finished within a single contract, it might be possible to adapt mechanical finishing equipment. At least one manufacturer has developed a concrete finisher with drop-down wheels for quick transportation between set-ups.

The public judges the road-builder by the riding quality of the finished pavement, about as much as by any other criterion. It shouldn't cost any more to make small bridge crossings completely uneventful to the road user, and the smoothness would contribute to the maintenance saving.

Recovery on terminated government contracts

A Government contractor's recovery for work completed on a fixed-price contract, terminated before completion, may not exceed the pro-rata share of the total contract price even if reasonable value of work completed exceeds the total contract price. This is the substance of a ruling issued by the Comptroller General of the U. S. on February 18, 1953. It should be noted, however, that there are no sustaining court decisions on this question. Recovery in excess of that specified, however, may be made by due legal process in the Court of Claims.—*Virginia Road Builders Assn.*



★ High-powered electric tool seen operating a chain saw, and loaded on trailer for transport

Army engineers test new high power tool

Contractors and construction men, who often take up military equipment ideas and put them to good use, will be interested in a new tool set which Army engineers are contemplating. Designed for high power and extreme portability, these electric units are being tested at the Engineer Research and Development Laboratories, Fort Belvoir, Virginia.

Major power tool manufacturers have cooperated with the Laboratories in designing a set of high-cycle electric power tools which will provide round-the-clock operation and greatly increase the productive capacity and efficiency of Army engineers in the field.

Consisting of two chain saws; two circular saws; one $\frac{1}{4}$ -in. and one $1\frac{1}{4}$ -in. capacity drill; two impact wrenches; a grinder; an electric hammer; floodlights; a 180-cycle, 220-volt, 3-phase, $2\frac{1}{2}$ -kw engine generator; and various accessories, the set is transportable on a $\frac{1}{4}$ -ton trailer. Weighing only 1,370 lb. with the trailer, it can be dropped from a plane.

In event the engine breaks down, parts can easily be repaired or replaced since a standard type Army engine is used to drive the tools.

Army engineers have already tested the set in Korea where it was used to construct bunkers, assemble bolted steel fuel storage tanks, and on numerous other jobs. Rigid tests have also been conducted in Europe and within the zone of interior.

If adopted by the Army, the set will provide a highly effective supplement to hand and pneumatic tools which were used during World War



II and are still standard items. Because of its light weight and corresponding high mobility, the set can be used in extreme forward areas where the heavy pneumatic compressor and tools are impractical. The electric generator and any two of its tools can easily be carried by two men if the trailer is stopped by rough terrain or enemy fire.

Florida engineers reject toll road in favor of U. S. 1

Proposals to build a toll expressway down the east coast of Florida to Miami, have fallen through. Instead, the Florida state road department has announced a program to improve existing U. S. 1. The job would cost about \$40 millions, as against \$110 millions for the turnpike, and would entail 4-laning and other improvements in U. S. 1.

The proposal as outlined by state road chairman Richard R. Simpson is tied in with a proposed 3-year financing scheme, utilizing a substantial allocation of the 4-cent gas tax proceeds earmarked for state road construction. Four-laning in the Fort Lauderdale district of the road board would cost about \$12,250,000; the 180 miles in the Daytona Beach district would require \$26,800,000. These figures do not provide for any by-pass construction, such as was proposed in the turnpike around Daytona Beach, St. Augustine and elsewhere. Under the new scheme, traffic would continue to thread through wayside cities along the east shore.

The toll road, under consideration for some time, would have been located along a Central Florida route. Other locations were also suggested

all of which failed to have the backing of civic and commercial interests in the shore cities. The Capitol Engineering Co., of Harrisburg, Pennsylvania, presented data to the road board, along with representatives of a New York investment banking firm. The engineering firm's report, drawn without request or compensation from the road board, pointed to the establishment of a turnpike authority by the legislature, empowered to float bonds. The decision to abandon the toll project followed the failure of a satisfactory private financing proposal to materialize.

Tuttle new Mass. chief



★ William C. Tuttle, new Chief Engineer, Massachusetts Department of Public Works, Boston. He succeeds Philip H. Kitfield, who has become Chief Engineer of the Massachusetts Turnpike Authority. Mr. Tuttle, a 32-year veteran of the Department, was advanced from the post of Construction Engineer



★ "Second story" concrete being placed with one paver between the forms and one outside—U. S. 29, North Carolina

North Carolina Improves Heavy-Duty Route

A major "second story" concreting job was included in revamping a section of the state's busiest truck route. Design and construction details here summarized

By C. E. Proudley

Chief Materials Engineer, North Carolina State Highway and Public Works Commission, Raleigh

IN Division 6 of the North Carolina State Highway and Public Works Department, great changes have been made on a 13-mile section of U.S. 29 near Lexington, N. C., under the direction of Commissioner George Coble and Division Engineer T. G. Poindexter. U.S. 29, which traverses the state in a northeast-southwest direction, is the state's most heavily traveled truck route. In addition, this section of pavement in the Lexington area carries traffic of U.S. 52 and U.S. 70.

Project 5256, as it is designated, provides a dual highway. A 4.7-mile portion, known as the Lexington bypass, is of the expressway type, with cross traffic carried over or under the main route and with provision for the construction of service roads to control access and prevent "ribbon" development.

Of particular interest in Project

5256 is the fact that more than 8 miles of old portland cement concrete pavement was resurfaced with a 7-in. thickness of reinforced concrete. According to State Highway Engineer W. H. Rogers, Jr., this type of resurfacing was selected because it was best suited for the existing conditions and best afforded the extremely heavy traffic the maximum amount of transportation service.

Very Heavy Trucking

The resurfacing development starts at the Yadkin River in Davidson County and extends to Lexington. The bypass portion starts near the southwest city limits of Lexington and extends in a northerly direction around the

city. The average daily traffic count on U.S. 29 at the Yadkin River was 6,080 vehicles in 1952. Of this total, 1,484 were trucks and buses including about 900 multiple-axle trucks. This adds up to 24.5 per cent commercial traffic—a very high percentage.

Bids on Project 5256 were first taken early in 1952. In order to take full advantage of price reductions made possible by letting sizable yardages of portland cement concrete paving, three Federal-aid projects were combined into one. Accordingly, in March, 1952, bids were taken on 255,180 sq. yd. of new 9-in. slab and on 113,575 sq. yd. of 7-in. concrete resurfacing, which would result in 12,983 miles of divided-lane construction with each lane 24 ft. in width.

The contract was awarded on low bid to the Rea Construction Company of Charlotte, N. C. The principal bid items are given in the accompanying table.

REA CONSTRUCTION CO. BID ITEMS

Quantity	Unit	Unit Bid Price
36,575	Cu. yd. of subgrade reinforcement.....	\$ 4.20
255,180	Sq. yd. portland cement concrete pavement, 9 in.....	3.26
3,000	Sq. yd. portland cement concrete pavement repairs, 7 in. uniform.....	5.00
24,060	Cu. yd. reinforced concrete overlay pavement.....	15.00
5,800	Sq. yd. removing existing pavement.....	0.80
50,000	Sq. yd. trimming off asphalt.....	0.10

Pre-grading was completed about a year prior to paving. Sub-grade treatment was included in the paving contract. The selected borrow material was hauled and spread by truck and checked by string line. The crushed stone subgrade reinforcement was also hauled by dump truck and spread in thin layers by "tail gating" and motor patrol. Stone spread was controlled by string line measurements from grade stakes set along the pavement edge. After spreading, rolling was done with a rubber-tired traffic roller, followed by sprinkling and further rolling with a 10-ton 3-wheel steel roller.

New Paving Details

Paving began on the new northbound lane at the south end of the project on July 23, 1952. The pavers reached the Lexington area on August 22 and began placing concrete on the by-pass route which is all on new location. This by-pass was completed by Oct. 14, 1952, at which time a total of 249,023 sq. yd. of 9-in. uniform slab had been placed.

Rea Construction Company with H. Barksdale as superintendent elected to use two Rex 34E dual-drum pavers, one operating inside the forms and the other on the shoulder. This proved to be a smooth-working combination. There were many working days when more than 2,500 ft. of 9-in. pavement, 24 ft. in width, was placed. The best day's production was 3,037 ft. of full-width road.

Concrete Resurfacing

Based on a record of successful concrete resurfacing in North Carolina extending back 24 years, a decision was made to place a concrete resurfacing on the old concrete road southwest of Lexington. It had been given a resurface of asphaltic concrete several years ago but this had become quite rough. Even before the present project was constructed, maintenance forces had removed sections of this resurface down to the old concrete.

The contract called for 50,000 sq. yd. of trimming off the old asphalt. Where the mat was fairly loose, it was removed by motor graders. In areas where the asphalt was rough but still well bonded to the old concrete, it was smoothed up with a conventional flame heater and scraper, which removed the high spots.

The concrete also provided for 3,000 sq. yd. of concrete pavement repair 7 in. thick. In badly broken areas the old concrete and asphalt surface were entirely removed, subgrade treatment placed, and a new concrete patch placed. A conventional paver was used to mix the concrete.

Resurface Design

The design for the concrete resurface as well as the new northbound lane was under the direction of Design Engineer Edward Cothran, who worked closely with Division Engineer T. G. Poindexter. Mr. Cothran has reported as follows on methods used to design concrete overlays:



★ Old pavement was sprinkled, heavy screed (drawn by paver) struck off the lower lift. Following placement of mats, top-lift concrete was dropped by second paver, then standard finishing train took over



★ Preparatory to placing a 24-ft. resurface slab over the 22-ft. pavement, a 3-ft. wide subgrade reinforcement was constructed on either side to support the pavement overhang. Shown here are first and second lifts being rolled. (Photos by N. C. State Highway and Public Works Commission)



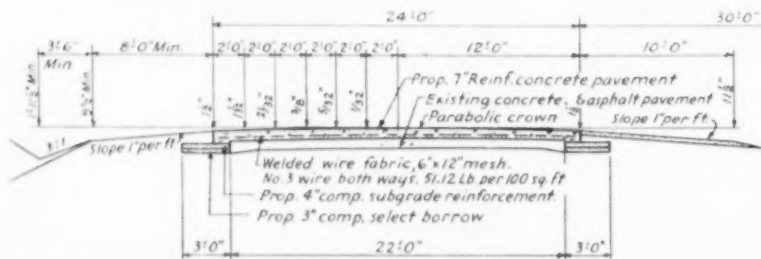
★ Rea Construction Company's batch plant for U. S. 29 job



★ Old pavement was core drilled in a program to evaluate it as part of the resurface design



★ Badly broken areas in the old slab were removed, subgrade treatment placed, and a 7-in. patch made



★ Typical cross-section of concrete-resurfaced section

"Concrete roads that are resurfaced are usually designed on the basis of the law of squares. That is, the square of the existing thickness plus the square of the overlay equals the square of the required thickness of a single slab. Expressed as a formula it becomes:

$$hc^2 + he^2 = h^2 \text{ or}$$

$$he = \sqrt{h^2 - hc^2}$$

he = overlay thickness

hc = thickness existing slab

h = equivalent thickness of a single slab

"This is considered true, providing there is no bond or friction between the two slabs or beams. The formula has been further modified when concrete is placed directly on concrete to the extent that h^2 is reduced to $h^{1.87}$ because of the bond and friction developed. In addition, a coefficient C is introduced to evaluate the old pavement. C is considered as 1 for a pavement in good condition, varying down to 0.35 for pavement in poor condition. When a separating course of asphaltic material is placed on the old road, de-

flections in the resurfacing could be greater and all possible chance for bond or friction at the interfaces is eliminated. Accordingly, two formulas have been in general use:

$$hc = \sqrt{h^{1.87} - Che^2}$$

for concrete on concrete

$$\text{or } hc = \sqrt{h^2 - Che^2}$$

for concrete resurface where a separating course has been used.

"For Project 5256 on U.S. 29, a single slab thickness of 8 in. was considered adequate for normal anticipated traffic, which would have resulted in a 6-in. concrete overlay on the old 9-7-7-9 slab. This old concrete had been given a 2+-inch surfacing of asphaltic concrete, which had proved to be difficult to keep in place. However, truck traffic is increasing at such a rapid pace that it was decided to place a 9-in. uniform slab on the north-bound lane.

"To make the south-bound lane comparable, a 7-in. concrete resurface was designed which was based on a coefficient C of 0.6 for the pavement. The widening is only one foot on each side of the old slab, so it was a matter of little consequence if the edge widening was 9 or 10 in. thick. A 10-in. depth was selected.

"Subgrade treatment on the widening is similar to that used on the new north-bound lane; it is extended to 3 ft. beyond the edge of the old slab. The depth was carried to the bottom of the edge of the old concrete.

"The distance between contraction joints is 30 ft. This is considered a long panel for resurfacing, but experience in this area warrants the use of such a long spacing of contraction joints. For insurance, a mesh was used in the resurfacing, consisting of 6 x 12 in. mesh of No. 3 wire, weight 51.12 lb. per 100 sq. ft., placed 2 3/4 in. below the surface. Care was taken to cut the mesh at each joint to prevent transfer of tension to adjoining surface panels. This was considered an



★ Trucks did not dent this well compacted granular subgrade, prepared for new pavement lane

important feature. Contraction joints in the resurfacing were matched exactly with those in the original pavement where they could be seen.

"No expansion joints or dowel bars were used either in the overlay or the pavement placed on selected sub-base. The standard contraction joint spacing in North Carolina is 30 ft."

Labor-Saving Methods

Prior to placing the concrete resurface, the old road was cleaned and swept with a power rotary broom. Later, when the old road was being widened 12 in. on either side with 10-in. depth concrete, a pneumatic hammer was used to drive form pins. The concrete resurfacing was started near the southwest end of the project on Oct. 21, was completed on Nov. 19, 1952, and opened to traffic in January. During the construction period, traffic was carried on the new north-bound lane from the Yadkin River to Lexington. The maximum day's production on the 24-ft. concrete resurface was 2,944 lin. ft.

Air-entrained concrete was used throughout the project. The concrete design included a cement factor of 1.30, with 6.1 gal. of water per bag of cement and a yield per bag of 5.192 cu. ft. Air-entraining agent was added to the sand at the batching plant. Amounts of air-entraining agent used, after adjustment of the mix, were $\frac{3}{4}$ to 1 oz. per bag of cement. Air contents, which generally varied from 4.4 to 5.3 to be within the limits of 3 to 6 per cent, averaged about 5 per cent. Air content was determined by the pressure method.

Experiments were made to determine whether any appreciable entrained air was lost by vibration. A number of air tests indicated that a loss of 0.2 to 0.5 per cent was measurable after vibrating as much as two minutes, which is longer than the peri-

(Continued on page 96)



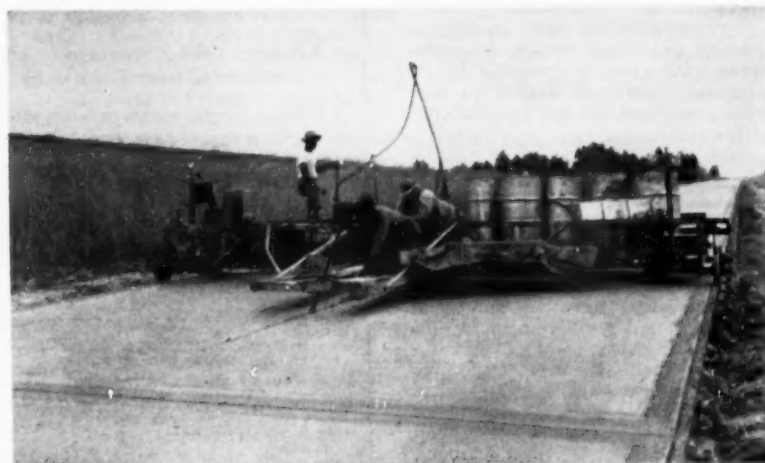
★ U. S. 29 dual section—now two ribbons of concrete, designed for very heavy truck traffic



★ Spreading stone for 4-in. compacted thickness subgrade treatment for new pavement



★ Cutting of centerline joint and removal of dummy joint strip. The latter operation, along with other finishing work, was performed from a Heltzel machine, also used for mechanical spraying of curing membrane. (Photos by N. C. State Highway and Public Works Commission)



How Post-War Mechanical Advances Have Brought More Efficient Earthmoving

Stepped up horsepower, bigger and lower pressure tires, better transmissions, improved controls and operator comfort—these and other recent innovations have made the new earthmover models more profitable, as indicated by this industry-wide review and analysis.

By Alan S. McClimon

Manager, Sales Development
The Euclid Road Machinery Co.

IN the past six years, American construction machinery manufacturers have developed rubber tired earthmovers with a productive ability far exceeding the capabilities of pre-1945 machines.

Engine horsepower in equipment generally in use has increased from a prevailing standard of 150 hp. diesel engine, to engines in the range of 275 to 300 hp. The yardage capacity of earthmovers powered by these larger engines has increased also. Performance has been improved. For example, a pre-war 13 cubic yard bottom-dump was powered with a 150 hp. engine; the 1951 version of the same size 13 yard machine is powered by a 190 or 200 hp. engine, resulting in an increase in its top loaded speed of about 20%.

This horsepower has been made more usable throughout the entire range of grade conditions by the use of multi-speed transmissions having as many as ten speeds forward, or more recently, through torque converters.

Tire sizes for the same capacity of payload have been increased several times, with a resulting increase in tire life and production ability on jobs where poor traction and flotation conditions exist.

Many Efficiency Factors

Taking a look at several different types of earthmoving equipment used in road building we see all of these elements of larger capacity, more horsepower, multi-speed transmissions and larger tires. One additional very important improvement is that of increased driver comfort. This improvement helps the operator to produce more yardage with less physical effort and less fatigue.

Rubber-tired Scrapers. We shall deal first with rubber tired scrapers, of the two-wheel tractor overhung engine type, such as the LeTourneau scraper, or the four-wheel tractor

type such as the Euclid 15.5-yard.

In 1941, of self-propelled scraper equipment, contractors had a choice of two machines, one with a capacity of 12 yards, and one of 8.7 yards. These scrapers had 12½ to 13 hp. per cubic yard of capacity.

More Power per Yard

Presently there are six major manufacturers of rubber-tired scrapers. These machines fall generally into two capacity ranges, 9 to 11 cubic yards and 14 to 18 cubic yards. The larger scrapers now have from 14 to 21 hp. per yard of capacity. It is interesting to note that the newer machines in this group have about 40% more hp. per yard than prewar machines of the same capacities. The Euclid 15.5 yard scraper has 17.8 hp. per yard. It has a 275 hp. diesel engine. A new 15-yard Caterpillar scraper, also having a 275 hp. engine, has 18.3 hp. per yard of capacity.

Most recently, the Allis-Chalmers (LaPlant-Choate) scraper of 14-yard size has come out equipped with a 275 or 285-hp. engine, replacing a power plant of 225 hp. output. This machine steps up its power to 19.5 hp. per yard of capacity.

These scrapers of 14 to 18 yards capacity are ideally used on large scale earthmoving, such as airport construction, earthfill dams, stripping of overburden or mineral deposits, and in road building. But there is also a trend to smaller scrapers. In each of the forty-eight states our highways are overcrowded, with dangerous blind curves, narrow shoulders, and inadequate road widths. Due to unstable bases, poor drainage, heavy axle loads, and high traffic density, there is partial or complete failure of road surfaces. To meet these emergencies, much of our present highway work involves resurfacing, widening, or partial relocation. Often there is a very small amount of earthmoving in state and county highway road contracts. For small-scale jobs, there are scrapers in the 9 to 11 yard class. Again, these new small scrapers have a high performance ability. The horsepower per yard of capacity meets the modern scraper standard of 17 to 18.5 hp. per yard.

Bottom-Dump Wagon. Another type of machine used in large volume

Why the new machines are more profitable

- Engine horsepower per pay yard capacity stepped up since the war—latest scrapers and wagons outproducing older machines.
- Rubber tired scrapers now have 17 to 19 hp. cubic yard capacity—compared with 13 to 15 hp. in wartime models.
- While larger scrapers have gained acceptance, the 9 to 11 yd. scraper still is favored on many road jobs because of transportability.
- Bottom-dumps now bigger, faster, more economical—thanks again to more horsepower per pay yard, better transmissions, bigger tires.
- Bigger tires pay off in a big way—better flotation eliminates pushers, cuts tractive resistance, eliminates “invisible haul grades,” greatly increases output.
- On rear-dumps, 10-speed transmissions with their greater selectivity increase up-hill speeds, cut cycle time.
- New emphasis on operator efficiency and comfort also paying profits. Operators can get more production when less fatigued, accidents are being lessened.
- But earthmoving jobs are still plagued with delays in hauling unit operation—a key management problem.

earthmoving on road construction is the bottom-dump wagon, used with a loading shovel, dragline or with a belt-conveyor loader.

Such a string, consisting of a loader, a crawler tractor to pull it, and from 5 to 15 bottom-dumps, depending on the job, and length of haul can turn out 500 to 700 yards per working hour.

The Highway Research Board made an investigation into three loader and bottom-dump jobs operating in the year 1949. This report showed that average production per hour of the loader during the net available working time was 527 cubic yards. However, this report showed that there was a 17% loss of available working time due to shortages of haulage units at the loader and that these delays plus other losses such as starting up or closing down, amounted to about one-fourth of the net available working time for the three jobs combined.

By providing enough haulage units with a loader, and by careful management of the operation to prevent unnecessary delay, the loader output could be increased from the 527 cubic yards production per hour during net available working time to an average of 705 cubic yards per hour for the production per hour during loader productive time.

The bottom-dump wagon is a versatile, flexible machine for roadbuilding, where the volume of earth to be moved is large, and the hauls generally exceed 1,500 feet in length.

There is no fixed distance at which it automatically becomes economical to change from a scraper earthmoving system to a bottom-dump application. Correct selection of equipment depends on many factors, such as type of soil, relative locations of cut and fill, and amount of yardage in each section, the haul distances, grades, requirements for spreading and compacting on the fill, and—obviously, what equipment is already on hand as compared with the costs of obtaining, or moving in an alternate team.

Properly, a cost-per-yard estimate and analysis of all these factors should be made to determine the most efficient and practical way to do a job.

Tire Advances

Larger Tires. The 13 yard bottom-dump wagon provides a good example of increased productive ability through the use of larger low pressure tires. In the adjoining table is shown the difference between the 21:00 x 24 tire used in 1945, and the 24:00 x 25 tire now used on the same size tractor-trailer:

Is this 28% increase (\$1300 per machine) in first tire cost justified?

As we know, there is a resistance to forward motion set up between a tire and a travel surface. On a hard surface, with no loose material, this resistance is considered to be 40 lb. of pull per ton of gross weight. On a soft, spongy, or sandy haul road the

Example of How Better Flotation Pays

A job in the Mississippi Levee country in 1950 shows just what can be accomplished with large low-pressure tires. A total of 75,000 cu. yd. of topsoil was being placed on the land side of a levee to form a seed bed for heavy grasses, planted to reduce the erosion caused by wind and water. The levee was about 2,600 ft. long. Four bottom-dump Euclids were being loaded by a 2½ yard dragline. Three of these units were equipped with the 24:00 x 25 tires, and the one older machine used 21:00 x 24 tires. All other elements such as engine, transmission and trailer capacity, were identical. All were on the same haul, and in that part of the state the haul roads and fill areas are soft and spongy.

The units with large tires moved capacity loads over soft sections of the haul road at an average speed of 6.5 mph., while the older unit frequently needed

a push by a crawler tractor at the dragline and on the haul road. Although both models had the same rated capacity, the newer model averaged 11 cubic yards bank measurement per load through this rough haul while the model with 21:00 x 24 tires could haul only 9 bank yards, or one less bucket load from the dragline.

The detailed time cycle showed an 18% faster cycle time for the loaded portion of the haul, and a 22% greater payload in favor of the 24:00 x 25 tire.

The unit with larger tires moved 196 yards more per shift because of better flotation. At 35c a yard this machine earned \$68.50 more per day—and could pay off its additional first cost due to tires in less than twenty operating days.

Large low-pressure tires do indeed "pay off."

	13 Cubic Yard Euclid with 24:00 x 25 Tires	13 Cubic Yard Euclid with 21:00 x 24 Tires
Total Time Cycle.....	9.6 Minutes	11.0 Minutes
Trips per Ten-Hour Shift.....	62	54
Bank Yards per Load.....	11	9
Total Yards per Shift.....	682 Cu. Yd.	486 Cu. Yd.

tire sinks into the surface and the rolling resistance increases very rapidly. This increase is about 30 lb. of pull per ton for each inch of tire penetration. In some instances the fill may be very spongy, with the material flowing in a wave ahead of the tire even though the tire may not penetrate deeply into the surface. In such cases the resistance may exceed 300 lb. per ton gross weight, or about the equivalent of going up a 15% grade.

Interchangeable Units. Because each of the two types of equipment—scraper and bottom-dump — does a low-cost job within its field of application, some contractors are showing interest in a combination unit, so that the same high speed tractor can be used with a scraper, or with a bottom-dump wagon. The aim, of course, is to obtain the lowest possible haulage cost.

This play would call for merely dropping off the scraper and transferring the scraper tires to a bottom-

dump wagon, which then could be hauled by the same prime mover. Since the ownership costs of the idle scraper or wagon continue, while no productive use is made of this equipment, this "hidden cost," plus the expense of change-over must be considered in arriving at any potential savings. So far, at least, this is not a widespread practice, although it can be done with several different makes of equipment.

25-Yard Wagons

Until 1950, most of the bottom-dumps used in road building were in the 13 to 15 cubic yard class. However, in 1950 and 1951, one eastern contractor used a fleet of seven 25-yard wagons on the Mohawk Freeway near Syracuse, New York and later used the same equipment with a loader on the New Jersey Turnpike. At last report, this loader was working close to finish grade on a 1,000-ft. cut, and was taking a shallow loading cut of 6 to 12 in. depth. Only two or three

	21:00 x 24	24:00 x 25
Approximate cost per tire and tube.....	\$1,168	\$1,500
Number of plies.....	20	18
Rated load capacity.....	15,490 lb.	16,900 lb.
Inflation pressure.....	40 lb.	35 lb.
Gross contact area at ground, sq. in.....	324	457
Increase in capacity.....		9%
Increase in contact area.....		41%
Decrease in inflation pressure.....		12.5%
Increase in first cost.....		28%

loads were obtained between loader turnarounds, and heaped loads of 26 bank yards were obtained in about a minute. There has been no particular problem in maneuverability of this 25-yard machine, which is 49 ft. long. There was very little traffic problem with seven large units on narrow one-way bypass roads and on small and congested fill areas. Twelve to fourteen of the smaller 13-yard haulers on this job would have created a sizeable traffic control problem since the construction haul road crossed a well-traveled four-lane public highway.

Rear Dumps. In rock haulage, the shovel and rear-dump truck are commonly used. Contractors tell us that as a rough rule-of-thumb the truck body should be 3 to 6 times the shovel dipper capacity, since there is an economic relationship between shovel and truck body size. Accordingly a 10 cubic yard off-highway truck matches with a 1½ or 2 cubic yard loading shovel—a size widely used by contractors since these are the largest shovels which can usually be shipped by rail without major dismantling.

The 15-ton rear-dump truck shows us a sample of the improvements made in transmission of horsepower during the past several years. This truck, equipped with a 5-speed transmission, can negotiate a 4% grade at 10 mph., whereas a truck with the

same engine, same load, same tire size, but with a 10-speed transmission can ascend the 4% grade at 13.5 mph. This is a gain of 35% in terms of miles per hour, due to better selection of transmission ratios in the 10-speed box.

With wider choice of gear ratios, the operator can obtain higher average road speeds, especially in work where there is a lot of hauling up adverse grades, or where haul roads have soft or rough spots which reduce the engine rpm. and force the operator to shift to the next lower transmission gear.

Consider the Operator

All of this "built-in" productive ability—obtained by larger capacity, better performance, larger tires, and better transmission of power—is of little use unless we make it easy for the operator.

Driver comfort improvements in all construction machinery have included these: Better seating, positioning of controls and visibility, better springing and weight distribution, power steering or electric steering control, and air boosters on clutch pedal to relieve fatigue.

Steering improvements include the use of electric steering such as used on the Tournapull where the operator is provided with push-button toggle switches actuating an electric motor

to steer the prime mover, and hydraulic booster steering arrangements used by Caterpillar and Euclid on their 4-wheel tractor scraper.

These examples of modern steering methods show just one phase of the over-all attention being paid to driver comfort through improvements in operation. Ease of operation helps industry capitalize on the human element, and adds to the constant increase of productive ability of our modern earthmoving equipment.

Twin-Engine Scraper. Now let's take a look at a machine which is just beginning to come into widespread use in contracting operations—the twin-powered scraper. One engine powers the drive wheels of the pulling tractor, and the rear engine provides drive power and traction to the wheels of the scraper trailer.

This machine continues the trend toward better performance. It has 21 hp. per yard of capacity. It continues the trend toward high productive ability since it has an 18-yard bowl and can travel at speeds up to 30 mph. It continues the trend toward ease of operation by using torque converters in both the front and the rear power trains. When power is needed for loading or for hauling over rough or soft haul roads, the operator uses the power of the engine in the rear of the scraper to bring both engines into play.

There are two independent throttles so that the operator can control each engine individually or can operate both engines simultaneously. There are hydraulically actuated transmissions behind the torque converters of both the front and rear engines. These transmissions are shifted simultaneously by movement of a shift lever which operates solenoid switches to shift the front and rear transmissions. The tractor is equipped with hydraulic booster steering and hydraulically actuated bowl and apron lift controls.

This machine costs in the neighborhood of \$52,000, so you can readily see that in order to pay its way and make money for the contractor, it must have this "built-in" productive ability that we have been talking about.

But there is still much to be done in the way of actually using these abilities on the job. The job superintendents, maintenance men, operators, and grade foremen are, of course, the key people in seeing that the abilities built into modern machines are actually used.

Modern thinking and modern machinery will continue to lead the way toward lower cost construction projects the world over.

• Over 80,000 tests are made annually on fifteen thousand or more materials samples, notes a news release by the New Jersey State Highway Department, which is presently enlarging its testing laboratory facilities at Trenton.

Tournacrane speeds resetting of concrete finisher on airport

The tricks used by contractors to move spreader, finisher and other form-riding units from lane to lane in pouring airfield pavements are many. Reported to be one of the speediest is the method pictured here. The lifter-upper is a Tournacrane. The

contractor is the joint venture combination of Morrison-Knudson Co., Inc., Macc Corporation and Ford J. Twaits Co. The job was the paving of new facilities at Miramar Auxiliary Naval Air Station, Miramar, California.

The inter-lane moves comprised a major operation here, where a 6,000 ft. taxiway and two large aprons were concrete paved. The 12-in. concrete was laid in 25-ft. lanes.

★ How 25-ft. finisher was moved from lane to lane on apron job





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EXTRA OVER-ALL ECONOMY! Many things contribute to lower hauling costs with Chevrolet. But, few are as welcome news to buyers as the fact that Chevrolet trucks list for less than any other truck of comparable size and capacity. See your Chevrolet dealer. Chevrolet Division of General Motors, Detroit 2, Michigan.

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New Dual Axle Has Far-Reaching Significance In Highway Transport

THE entire highway transportation industry, as well as construction industry people, are eyeing a new mechanical development for its possible effect on the economics and safety of rubber-tired hauling.

This development is Chain Belt Company's new Rex-Spangler dual front axle, more completely described as a "dual steering tandem front axle." Announced in April after several years of research and testing in service, the unit is being offered immediately for the ready-mixed concrete industry, with the entire construction industry being explored for its possible utilization of the unit. The unit's mechanical features and an example of the increase in payload it makes possible, are summarized on page 108 in this issue in the new equipment section.

Highway officials, legislators and over-the-road transport companies all have a deep interest in the Rex-Spangler unit. This interest lies in the struggle now being waged by truckers throughout the nation to carry the maximum payload without exceeding the maximum axle loads permitted on the highways by various state laws. These laws, designed to protect the highway pavements and roadbeds, have been the subject of a storm of controversy, resulting in a series of costly road tests such as the Maryland test, the Idaho test now in progress, and the Illinois road test planned. Trucking interests who are participating in these tests have huge sums at stake, since their profits rise sharply with each ton of added permissible payload over a certain limit.

More Revenue Tons

The potential importance of the new dual axle lies in its contribution to a better distribution of weight, making possible the carrying of more tons of revenue load safely under existing highway laws. While rear axles are commonly loaded up to the limit, the single front axle usually travels light to facilitate steering and operating.

There are only two methods by which additional payload may be legally and safely carried, notes a statement from Chain Belt Company. One is to purchase more lightly built equipment which will, however, not last as long and will require more maintenance. The other is to secure better weight distribution. Obviously every additional axle on a vehicle will increase its ability to carry payload weight. A fourth axle on a tandem-rear-axle-equipped truck-mixer makes possible the addition often of 5 to 7

tons more payload, without exceeding the over-all load limit or the 18,000-lb. limit on any one axle. The ready-mixed concrete industry can thus get bigger loads without recourse to semi-trailer units with their poor maneuverability and tendency to "jack knifing."

Owners of trucks in all fields have an interest in the new unit, it was explained, because it permits better steering control in rough going. With two axles, at least twice the rubber contact on the road is secured, and the greater combined weight on the front end gives stability as well as improved steering and braking action.

Highway safety engineers will see other safety possibilities in a dual-front-axle system of this kind. One is the lessened hazard from a front-tire blowout, which leaves three good tires, with no tendency of the vehicle to sway or the driver to lose control.

Fundamental Safety Advantages

The dual axle offers more efficiency and safety in turning on curves and corners, since twice the tractive capacity is available up front for controlling the vehicle, a specially important factor on slippery or icy surfaces.

Contractors and other operators of off-the-highway equipment will see an advantage in the superior flotation achieved by four tires in front. The dual-front-axle-equipped truck in tests has traveled soft and rutted ground that would stop the same truck having only a single front axle, and with less wear and tear on the truck. Since the load is spread more, the tires sink down less, requiring less tractive effort.

All types of truck owners have the common problem of reducing driver fatigue, which they find is a major contributing factor in accidents and lowers hauling output and efficiency. The manufacturers have given the greatest emphasis to the comfort advantage demonstrated through better shock absorption and less steering-wheel "fight" on rough roads.

The development comes in the wake of some 150 other attempts to devise such a device, according to a patent search. Previous designs, including one in England, have found limited use because the problems of wheel articulation and steering were not solved satisfactorily for today's requirements. The Rex-Spangler design is said to achieve complete equalization of weight in a system which utilizes a "walking beam" to create a "tandem bogie," that steers all front wheels properly under all conditions of turning and road roughness.

• **H. Stanley Bent**, 80, former head of Bent Construction Co., of Los Angeles, died recently at his home in San Marino, Cal. Mr. Bent, nationally known as a dam builder, began his career in 1901 when he joined the Bent firm founded in 1886 by a brother, the late Arthur S. Bent. His company built 32 dams, including Friant and other large western structures.

• **Merritt-Chapman & Scott Corporation**, general contractor, New York City, reports a backlog of \$144,000,000 in construction work, according to a recent announcement from Louis E. Wolfson, president. This represents a gain of 73% over a year ago.

★ The Rex-Spangler dual front axle unit is shown in action. Note flexibility over rough ground



Progress statement given out on Washo test road

The Highway Research Board has issued a statement describing the nature and the general extent of the damage to the WASHO test road caused by the 17,000 heavy axle applications which were applied in the test last fall.

In designing the test pavement, the engineers selected a range of thicknesses which they considered to include average design, over-design, and under-design, for the contemplated test traffic and for the construction materials used. They considered it likely that the thinner sections would fail before the end of the test and the thinnest sections earlier.

In research of this type, satisfactory interpretation of the load carrying capacity of the pavement is more effectively obtained if the variations in axle load and pavement thickness extend over a wide range.

There are five different pavement thicknesses, ranging from 6 to 22 inches, in each of the two loops of the test road. The 1952 test traffic caused appreciable cracking and displacement of the surface in the two 6-in.-thick sections that were constructed with only 4 inches of granular base and 2 inches of asphaltic concrete surfacing over the subgrade. Surface cracking in very small areas in some of the thicker sections under the heaviest tandem axle loads was also noted. In all of the thicker sections and except in very small areas in the thinnest sections, maintenance, consisting of the use of thin bituminous skin patches over the cracked areas, retarded development of cracking to such an extent that it was possible to continue the test traffic. In certain small areas of the thinnest section under the heaviest loads, it was necessary to remove the existing pavement and replace it with a thick granular base and new asphalt surface in order to maintain test traffic. No distress whatever was noted in 18 of the 23 test sections.

The WASHO Road Test project, located about half way between Ogden, Utah, and Pocatello, Idaho, is sponsored by eleven western highway departments with the cooperation of the Bureau of Public Roads, the Automobile Manufacturers' Association, the Truck Trailer Manufacturers' Association, the Petroleum Industry, and others. The Highway Research Board of the National Academy of Sciences, Washington, D. C., has been delegated the responsibility for the administration and operation of the research.



FIELD JOB REPORT

OWNER:

Carl Goodwin & Sons,
Allegan, Michigan.

PROJECT:

Grading and Paving 5½ miles
on highway M-140, Watervliet,
Michigan.

CONDITIONS:

Blue clay...average digging
depth, 14 feet.

EQUIPMENT:

MICHIGAN MODEL C-16 HOE with
31-inch dipper. Powered with
GM 2-71 diesel. Crawler pads
30 inches wide.

REMARKS:

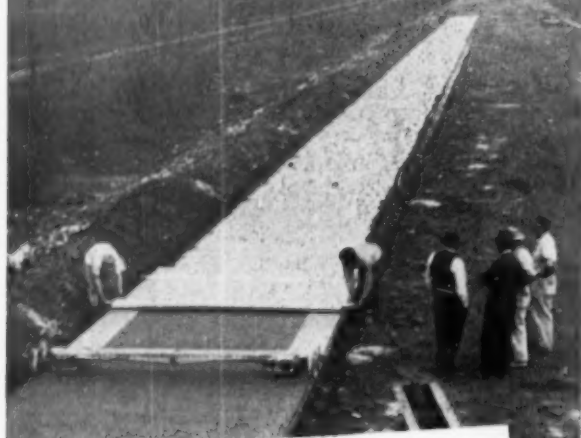
Wayne Goodwin reports complete satisfaction with his new MICHIGAN C-16 HOE. New gooseneck boom digs down to 18 feet. Real stability is assured with the C-16's 10'-1" wide, 11'-10" long crawler base. The 30-inch wide pads give a ground bearing area of 7,440 square inches.

WRITE FOR BULLETIN 1601 SUP.

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The test road was constructed last summer and test traffic consisting of 18,000 and 22,400 lb. single axle loads on one test loop and 32,000 and 40,000 lb. tandem axle loads on another, was operated last fall. The vehicles were stopped for the winter.

The first of three special studies of deflections under various axle loads at the WASHO Road Test was started early in April, 1953. These studies will provide the engineers with data showing the relative deflection in the pavement under moving trucks with single axle loads varying from 8,000 to 22,400 lb. and tandem axle loads from 14,000 to 40,000 lb. After completion of these studies which will take about two months, regular full scale test operations will be resumed.

Jersey turnpike carried over 18,200,000 vehicles first year

Operations of the New Jersey Turnpike in 1952 "surpassed the most optimistic expectations and far exceeded the 1949 estimates of the traffic and revenue engineers," the Commissioners of the New Jersey Turnpike Authority state in their annual report to the Governor and the Members of the New Jersey Legislature. Volumes of traffic and revenue equaled those predicted would be attained in 1968—some sixteen years hence, according to Commission Chairman Paul L. Trost.

During 1952 a total of 18,239,527 vehicles used the Turnpike, a daily average of 49,834 or 136 per cent over the 1949 financing estimate of 7,600,000 or 20,765 daily. Actual experience shows an increase of 136 per cent in revenue producing vehicles over those estimates.

Toll revenues in 1952 amounted to \$16,241,267, a daily average of \$44,386, an increase of 127 per cent compared with the engineers' estimates. Including revenues from the two concessionaires on the Turnpike, and miscellaneous other income, totaling \$1,588,369, the over-all revenues from operations were \$17,829,636.

Return from concession facilities in 1952 was 183 per cent higher than the engineers' estimates, despite an incomplete year (some facilities didn't open until late in May).

Many Benefits

The benefits to the State and its people from the construction of the Turnpike have been manifold, the Commissioners noted.

"By far the greater benefits accrue from increased job opportunities and the business and industrial expansion which has come, and is bound to follow, with the improvement of facilities leading to our farms and to our cities," they aver. "As constructed, the Turnpike opens up a vast new vista of development for much of the State. It solves, too, in a great measure, the problem of expenditures for other highways."

In discussing safety on the Turnpike the Commissioners state that the safety record of the Turnpike is better than that on the State and national public highway systems. The recent addition of 15 State Police to the staff, together with the adoption of certain other measures has further improved the safety record in spite of adverse weather conditions and unusually heavy traffic volumes.

Over six major holidays in the past year when traffic was at its heaviest—Washington's Birthday, Decoration Day, Labor Day, Thanksgiving Day, Christmas and New Years—the Turnpike experienced not a single fatality and relatively few accidents as compared with a heavy toll on public highways. The accidents in 1952, they comment, were less than one-fifth those for the parallel highways on the basis of the standard formula used for years by the federal and state governments, and by the National Safety Council. There were 33 fatal accidents on the Turnpike last year, with 50 million persons carried varying distances.

New Safety Campaign

"While the Turnpike's safety record is good, the Commissioners feel that, because of the many basic features built into the highway, the safety record should be better and that every practical step must be taken to make it better," the Commissioners declare. "Needless to say, the accidents and fatalities on the Turnpike are the result largely of human and mechanical failures and cannot be attributed to the design or construction of the highway itself. Engineering with its most modern techniques cannot control the thoughtlessness or recklessness of drivers on Turnpikes and public highways.

"The need for constant driver education is clearly apparent and the Authority has begun, and will participate in, such programs for the common good. The strict enforcement of speed limits and other safety measures will continue on the Turnpike in a determined effort to control those who are inconsiderate or unwise in their driving habits."



★ R. C. Wietersen

Engine Institute elects

R. C. Wietersen, Director of Purchases of the Buda Company of Harvey, Illinois has been elected President of the Internal Combustion Engine Institute, whose membership includes the major manufacturers of high-speed Gasoline and Diesel engines.

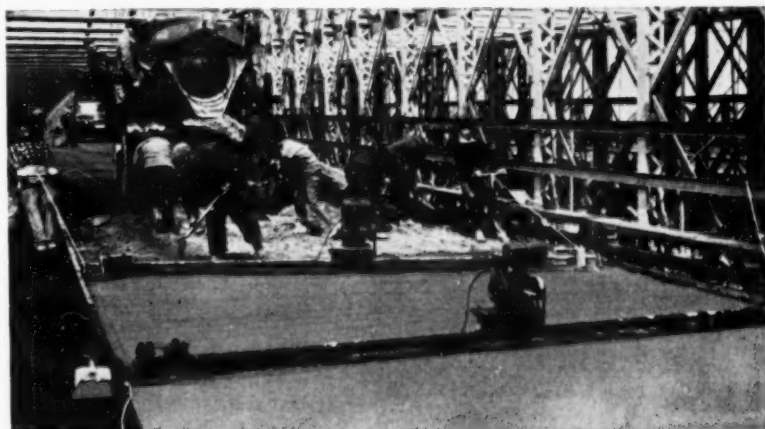
Other officers elected at the Institute's annual meeting were: Vice President, J. E. Heuser, Sales Manager—Engine Division, Le Roi Company of Milwaukee; Secretary, R. H. Kerr, Chief Engineer, Climax Engine and Pump Manufacturing Company of Clinton, Iowa and Treasurer, J. D. Cook, Secretary and Treasurer, Hercules Motor Corporation of Canton, Ohio.

• C. Edward Frisinger, of Ann Arbor, of John H. Frisinger, Inc., has been elected president of Michigan Road Builders Association for 1953. He succeeds Carl E. Goodwin of Carl Goodwin & Sons, Allegan, Michigan.

on the road IT'S MASTER SCREED for speed



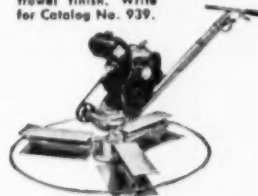
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Extending Drive Sprocket Life

The following is from No. 8 of a series of Maintenance Bulletins, distributed by the Caterpillar Tractor Co., to aid in reducing maintenance costs.

There are several methods of prolonging the service life of tractor final drive sprockets through good maintenance and operational practices and by three proven methods of reconditioning and salvage.

"Conservation" Bulletin No. 7 outlined the by-step procedure for replacing D7 and D8 Tractor sprocket rims by cutting off the worn rims and welding on new replacement rims. When the teeth of D7 and D8 Tractor drive sprockets are severely worn, the entire sprocket rim may be cut off and replaced with a new rim available from Caterpillar Dealers. In addition to this rim replacement on

the larger tractors, outlined here are two additional methods for reconditioning sprocket teeth on not only the D7 and D8 but on the D6, D4 and D2 Tractors as well. Materials for welding are generally available and only average skill is required in the application.

Build-Up with Weld Overlays

Building up worn drive sprocket teeth by hand welding has proven very economical and practical if the service is not delayed and provided the section below the tooth face is not less than 3/16" thick. Welding is then quite difficult as there is considerable danger of burning through the base metal and the resulting weld may not have sufficient strength to withstand the impacts of normal operation. However, severely worn teeth such as those shown below on this page have been successfully built up with "patch plates" of steel welded to the tooth sections.

Electrodes—Two general types of welding electrodes have given very satisfactory results for building up sprocket teeth:

1. **Medium and high carbon electrodes** produce a type of weld overlay which is moderately hard, but very resistant to impacts. Properly applied, the deposit rarely cracks or chips and displays good resistance to abrasion. In the various welding positions encountered on the sides of the teeth, it may be difficult to form smooth overlays with these electrodes. However, if the sprocket is positioned on a rolling center, practically all of overlay can be applied in a convenient horizontal or "down hand" position. Typical electrodes are: Lincoln Hardweld 50, 100; Hardex 20, 25; Westinghouse, Hardentough 100; P & H Harcote, 20 or 35; Hobart, Tufanhard, 250 or 400.

2. **Semi-austenitic electrode** deposits have excellent resistance to abrasion on sprocket teeth. Impact resistance is good and wear rate is low. Some brands of semi-austenitic electrodes are quite adaptable to semi-vertical welding positions and therefore can be applied to sprocket teeth higher carbon types. When semi-austenitic electrodes are used, medium or high carbon types may be used as an underlay and should always be used to make the string bead or "dam" around the teeth as outlined here. Typical of semi-austenitic electrodes are Lincoln-Abrasoweld; Amisco HF60; Stooddy 1027; Westinghouse, W. H.; Champion, Railend; Alloy Rods.

Procedure. Step 1. Sprocket teeth must be completely free of dirt and oil or grease. Brush off any scale or rust. A small wire scaling brush used



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with an electric drill or motor will speed up this work.

Step 2. Check the tooth wear with a template similar to the one shown here to determine on which sides of the teeth the heaviest overlays are to be applied to bring the teeth up to size. With a torch, *preheat the teeth to about 400°F.-450°F.* to relieve some of the existing surface stresses and prevent other stresses from forming.

Step 3. Following the preheat, position the sprocket on a rolling center so as to obtain "down hand" or horizontal welding positions on a section of the teeth. With 5/32" medium or high carbon electrodes laying a string beading or "dam" around one-half of each tooth as shown, and on all teeth, completely around the sprocket. Always work from the tips toward the center. Reposition the sprocket and complete the dam on the opposite sides of the teeth.

Step 4. After completing the string bead all around each tooth, proceed with the overlay. Using 5/32" electrodes of the type selected, lay wide beads transversely across each tooth starting at the tooth tip and working one head at a time toward the center. This prevents, to a great extent, heat localization at the tooth tips. Overlap successive weld beads 50%-60% to secure a complete bond to the previous bead as well as to the sprocket.

Step 5. When the first overlay is completed all around the sprocket, again check the tooth contour. If the tooth tips require considerable build-up, reshape these with medium or high carbon electrodes. Successive layers of weld laid first on one side of the tooth tip, then on the other will form the teeth to their original shape. Clean the slag from the first overlay and make the second pass using the same welding pattern. Always work from the tooth tip toward the root of the tooth. Generally, two overlays of weld (about 5/16" to 3/4") will be required to bring the teeth up to size. Grind off any high spots to prevent breakage or excessive wear of bushings.

Build-Up with Plates

Excessive worn sprocket teeth may be built up by the addition of steel plates formed to the contour of the worn sprocket teeth and welded in place. The forming process and the welding is not difficult and can be accomplished in the shop with tools normally at hand. Because the plates may be applied while the sprocket is assembled on the tractor, considerable time is saved. Plates offer the best solution to restoring sprocket teeth which are worn too thin—less than 3/16"—for the application of weld overlays. Longer wear life can be expected if the formed plates are hardened by heating to 1400°F.-1500°F. and quenching in oil after forming and prior to application, but very good service has been obtained from relatively soft, non-heat treated plates. Crack-free welds are easier to

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obtain on the softer plates. Plates should contain not more than .50% carbon but may have other alloys. Steel of the SAE 1035, SAE 104 or SAE 1050 types will give excellent results.

Step 1. From mill stock, cut a sufficient number of plates according to the dimensions shown.

Step 2. Heat one plate at a time and with a hammer shape it to the worn tooth contour. If the sprocket is off the tractor, an arbor press and a mandrel made of round stock or tubing may be used for forming.

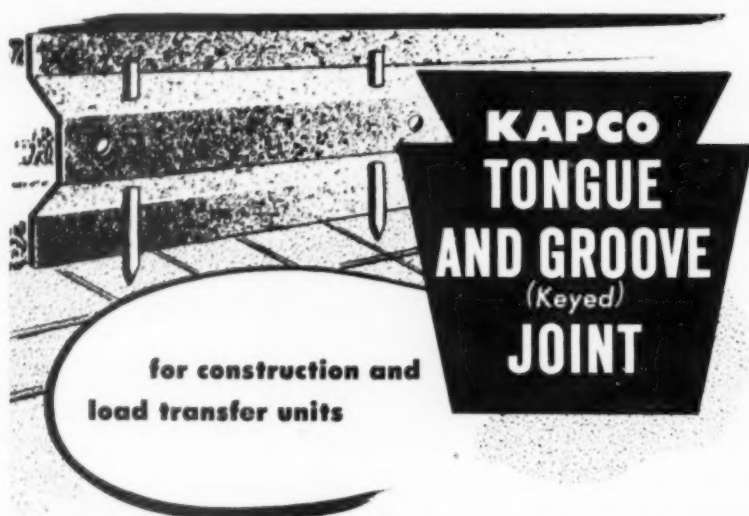
Step 3. Clean the plates and the sprocket teeth, brushing off the scale,

rust or dirt.

Step 4. Position the formed plates on the worn teeth and tack weld in place. With a cutting torch, trim the corners to correspond to the original bevel on the sides of the tooth tips.

Step 5. Preheat the plate and sprocket teeth to about 400°F. Using 1/8" AWS 6012 or 6013 mild steel electrode weld the sides of the plates to the teeth, working from the center toward the tips. (With heat treated plates use AWS 6016 electrodes.)

Step 6. With 5/32" electrode weld adjacent plates together at the tips, forming the tooth tip with one or more overlays of weld.



Kapco Tongue and Groove Joint is easy to handle and install. Can be used either as a center strip or contraction joint. It is ideally suited for the "lane-at-a-time" method of constructing highways, and for airports and heavy duty industrial floors where it provides a "keyed" surface with high load transferring properties and eliminates the danger of spalling at the joints or the tilting of the slabs.

Kapco Tongue and Groove is pre-formed to provide maximum joint efficiency. It is available in standard 4 1/2" to 9 1/2" widths and 10' 1" length which allows for overlap. Punched to accommodate 1/2" deformed steel dowels and channel type steel stake pins. Kapco Tongue and Groove Joint consists of mastic board and asphalt saturated outside liners.

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Summary

1. Restoring worn teeth to size can best be accomplished with two or more overlays of medium or high carbon or semi-austenitic electrode deposits. This method will produce overlay welds of very acceptable quality in the shortest time, and when the original overlay has worn off, this process may be repeated to again restore the sprocket teeth to usable limits. With the aid of a template for a contour guide, the welding operator can restore sprocket teeth with uniform overlays which will require only grinding off the high spots. D8 sprocket teeth can be restored in about four man hours and will require about 15 pounds of electrodes. D7 sprockets on which all teeth are built up require about seven hours and 20 to 24 pounds of 5/32" electrodes. For the D6, five hours and 15 to 18 pounds of electrodes; for D4 and D2 sprockets about three hours and 8 to 12 pounds of electrodes.

2. Even excessively worn sprockets can be returned to service if steel plates are cut to size and welded to the worn teeth. A complete set of formed plates can be welded to any sprocket in less than 2 1/4 hours. Time required for cutting and forming will depend entirely on the facilities available.

Ground-water problems in highway construction

The U.S. Geological Survey has released a report entitled "Ground-Water Problems in Highway Construction and Maintenance," prepared in cooperation with the State of Delaware. It discusses the occurrence of ground water in relation to problems in highway construction and maintenance, such as the subdrainage of roads; quicksand; the arrest of soil creep in road cuts and other problems. Copies may be obtained from the Delaware Geological Survey, Post Office Building, Newark, Delaware; or the Geological Survey Library, General Service Bldg., Washington, D. C.

Three New Koehring Distributors. Three new distributors have been announced by Koehring Co., Milwaukee, Wis. Kelbe Bros. Equipment Co., 5686 North Teutonia Ave., Milwaukee, Wis., will handle Koehring products for the entire state of Wisconsin.

The line includes equipment manufactured by Koehring and its three subsidiary companies: Parsons Co., C. S. Johnson Co., and Kwik-Mix Co. Kelbe Bros. succeeds Cunningham-Ortmayer as authorized distributor in the territory that includes the entire State of Wisconsin. Allied Equipment, Inc., 825 N. W. 72nd St., Miami, Fla., will handle Koehring products only in the 13 southern counties of the state. The new distributor, successor to the Florida Equipment Co., also will handle the Parsons Co. account.

The Northern California territory, which has been covered by Koehring Company West Coast Sales Division out of Stockton, has been delegated to the Standard Machinery Co., 450 Bayshore Blvd., San Francisco, Calif. In addition to Koehring equipment, Standard Machinery also will handle the sale of Parsons products.



★ Built-up dipper on Northwest shovel greatly increased daily yardages on the New Jersey Turnpike job

Side plates give oversize bucket capacity for easy digging materials

The accompanying pictures show how Grandview Construction Company temporarily built up the capacity of a 2-yard bucket for a fast loading project involving soft easily-dug materials.

The job was a sub-contract in connection with the New Jersey Turnpike grading work two years ago. The

soil was extremely easy to scoop up. Although no data are available on the production, the R&S editor was told that these extension plates worked perfectly in this case, neither overloading the shovel nor greatly slowing up its loading cycle in this particular material. The plates were easily removed when the job was through for return to normal digging materials.

(This statement is repeated from *March Roads and Streets*, where it was published with the wrong illus-

tration. The photos shown on page 77 of the March issue pictured an example of hard-facing of the side plates of a shovel dipper—a fine example of such work, but unfortunately not the right picture to illustrate the dipper capacity build-up described here).

LeTourneau Promotes Powers. Harry R. Powers, heretofore Eastern Area sales manager for R. G. LeTourneau, Inc., Peoria, Ill., has been promoted to the post of domestic sales manager. He succeeds R. P. Nichols who has joined the newly appointed LeTourneau distributor, Ryan Equipment Co., St. Louis, Mo.

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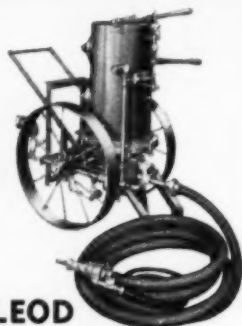
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In comparison with hand application of cement work, the MACRETE GUN is not only faster and more economical but gives a higher quality coating. Tensile strength will range from 10% to 200% better than hand work, and compression strength is even more marked—up to 700% greater, and with less voids. Adhesion is increased at least 25%. The MACRETE GUN comes complete with all fittings and accessories—ready to use.



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Available in range of sizes from 110 gallon to 800 gallon capacities.

The sturdy Macleod kettle has a return system for the heat from the burners with a separate section for the melted material. Inner kettle is constructed of 1/4" thick steel and bottom of furnace is insulated to prevent heat loss.

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One man with a Wilton Brush Saw clears more brush than a crew of six axe-men — safely and in less time, — cleanly, horizontally at ground level — underbrush, vines, brambles, second growth, saplings up to 4" diameter! Light-weight, fool-proof, requiring minimum of upkeep, Wilton Brush Saw, powered by rugged motor and husky V-belt, uses 8" or 10" saw, placed at angle for maximum cutting efficiency; leaves workman's two hands free to guide saw. Pays for itself in a month or less.

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Entire saw fits in car trunk.
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21 CLINTON STREET - MILFORD, N. H.

Kent County Cuts Brush, and Then Sprays Chemicals

By O. S. Hess

Engineer-Manager

Kent County Road Commission
Grand Rapids, Michigan

IN Kent County (Michigan) we are following the plan of first cutting the brush and then spraying the stubs with a chemical to prevent further growth. At the present time, and, for perhaps many years to come, the work on our paved roads will be handled by forestry crews. They are doing a complete tree trimming and brushing job on the whole width of right of way. They have with them on the job four-gallon Champion, knapsack-type, hand sprayers. Each day, everything which has been brushed out is sprayed. By using the hand sprayers, the chemical is not wasted and no shrubs or vegetation are destroyed because of faulty applications, as might be the case with power sprayers.

Brush cutting on our gravel roads is more of a hit and miss operation and is handled by our regular maintenance crews when they have an opportunity to do it. Each of our maintenance districts has been furnished with a four-gallon sprayer of the type previously mentioned and wherever they cut brush, the stubs are treated with the chemical. The chemical used is a 50-50 mixture of 24-D and 245-D. This combination is mixed with fuel oil or kerosene in the proportion of one pint of chemical to three gallons of the oil. 24-D is a weed killer and 245-D is a brush killer. The combination does a very good job.

We are not at all sold on any plan to spray standing brush. The brush must eventually be cut anyway unless we are satisfied to have unsightly roadsides for many years into the future. It is much easier to cut the brush when it is green than to cut it after it has been killed by chemical and is hard and dry. We feel we would rather not do the job at all than to create a lot of unsightly-looking roadsides. The method we will follow will, in a relatively short time, result in good-looking roadsides consisting of only the trees and shrubs we want left, plus grass. This will greatly reduce the cost of mowing which is necessary each year. We anticipate that some spraying, particularly for weeds, will be necessary during the first couple of years after the initial job has been done. This can be handled, however, with a power sprayer and at a very low cost.

We have now covered about 100 miles of State trunklines and a limited

mileage of county roads in the manner described. This work has been carried out over a two-year period.

The public's reaction to the job which has been done is excellent. There have been no complaints whatsoever but plenty of commendation and requests for more of the same work. The results obtained on the State trunklines have been so satisfactory that we are planning to cover our hard surfaced county roads in the same manner as fast as the work can be reasonably financed.

The work we have completed this year on our county roads has cost approximately \$370 per mile. The average would probably be about \$300 per mile, as we have been handling some of the toughest jobs first. The cost has been somewhat higher on the State trunklines because of the wide rights-of-way and the resultant quantity of work per mile.

New Penflex Distributor. Murray-Baker-Frederic, Inc., 626 S. Peters St., New Orleans, La., has been appointed distributor in New Orleans territory for Pennsylvania Flexible Metallic Tubing Co., Philadelphia, Pa.

Lima-Hamilton Appointment. Baldwin-Lima-Hamilton Corporation, Construction Equipment Division, Lima, O., has announced the appointment of W. M. Huston as manager of engineering of Lima shovels, cranes, and crushers for the Lima Division. Mr. Huston was formerly chief engineer of shovels and cranes. E. C. Halby succeeds Mr. Huston as chief engineer of shovels and cranes and the administrative head of the Shovel and Crane Engineering Department.



This scraper can pad pipeline, backfill ditch

A new kind of rig for padding pipelines, and usable for other ditch filling, this 274 h.p. Euclid Scraper has a power-driven screw which feeds material out of a chute on the side.

It is the idea of Anderson Bros. Corp. of Houston, Texas, who are using it for padding 150 miles of 24-inch pipe being laid in rocky country between Menard and Cedar Valley, Texas, for the Rancho Pipeline Co.

Before the rig was put into operation, the padding crew consisted of 35 men and 7 dump trucks. The rig made it possible to cover more foot-

age per day with 15 men and one truck. Anderson is also using two Euclid bottom dumps for backfilling, dumping alongside of the ditch and pushing the fill in with dozers.

The scraper was selected because its independently actuated hydraulic ejector makes it possible to feed a steady and closely controlled flow of material to the screw. In constructing the unit, the apron was welded shut, the feed screw installed in front of and above the cutting edge, and the chute extended out the side. The feed screw is chain driven from a gasoline powered engine mounted above it to the top of the scraper bowl. The scraper is top loaded with a front-end loader.

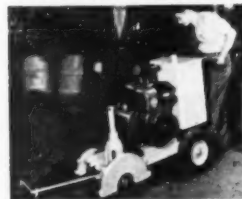
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★ Views of the rail puller in action at Clinton, Connecticut



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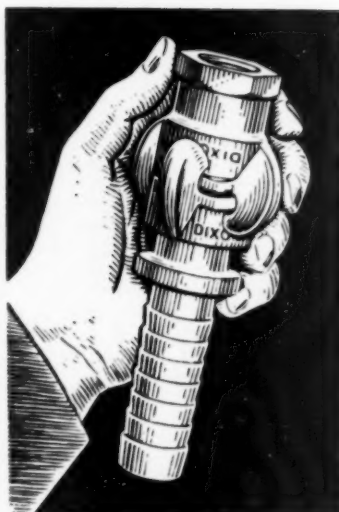


Bulldozer quickly removes old street rails

Pictured here is a bulldozer which was used by maintenance officials of the Connecticut State Highway Department to remove car rails from the main street of Clinton, Connecticut. The machine helped cut the duration of the job substantially, which was quite important because of the business aspect.

As described in the Connecticut Highway Department's publication "Cuts and Fills," the improvement when first proposed caused town officials and tradesmen serious concern because they feared that the restricted parking over a period of three weeks would seriously affect local business. The job in question was to remove the trolley tracks and the concrete pavement within 9 in. of the track zone and repave this area with a 2-in. thickness of dense graded bituminous concrete over a 3-in. penetrated broken stone base course, the foundation also including 3 in. of broken stone base and a processed gravel sub-base 6 in. thick.

Foreman James Lynch arranged with the bulldozer operator to remove the dozer blade, then attach a heavy chain to the draw bar and loop it around the end of the rail. The draw bar was then raised and dropped in a series of jerks, uprooting the rail and loosening the adjacent concrete in the same operation. Some 20 ft. sections of rail



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while used primarily for air-operated tools in field and factory, is equally efficient for water, oil and spray service. Illustration shows hose end and female I.P.T. end connected.

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were removed in five minutes' time. This operation required the use of the bulldozer and two men to block up the rail as it was loosened.

The project originally estimated to take three weeks required only 9 days because of this idea.

WITH THE MANUFACTURERS

Caterpillar Sales Department Realigned. A realignment of Caterpillar Tractor Co. sales department at the executive level has been announced by Director of Sales H. H. Howard. Newly created is another position of assistant director of sales. This gives Caterpillar three assistant sales directors; the new post became effective Jan. 1, 1953. The announcement was coincident with the return of J. W. Mohler to Caterpillar after 10 months as an official with the National Production Board in Washington, D. C. He will resume his former position of assistant director of sales by taking full administrative responsibility for the promotional activities of the sales department.

In this capacity he will have direction over the sales development, sales engineering, sales training, and market research divisions. J. J. Valentine and W. S. Ziegler will continue as assistant directors of sales with a realignment of duties. Valentine will be in charge of the western, plains and industrial sales divisions. Ziegler will handle central, eastern and governmental sales divisions.

New Lima Sales Representative. Baldwin-Lima-Hamilton Corporation, Construction Equipment Division, Lima, O., has announced the appointment of J. V. (Jess) Gunter as sales representative for Lima shovels, cranes and draglines. He will assist Fred L. Maus, district manager, in the states of Tennessee, North Carolina and South Carolina.

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for all-round
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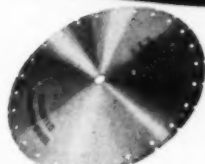
CAMM MANUFACTURING, 1425 FIRST STREET, SAN FERNANDO, CALIF.

Hawkinson Appointed Sales Manager. W. F. Hawkinson, Jr., has been appointed sales manager of the Large Excavator Division of Harnischfeger Corporation, Milwaukee, Wis. He comes to his new assignment after having been the corporation's district representative in southeast Asia and the Pacific area for the past two years.

Timken Promotes Two. Robert G. Morgan, heretofore district manager of the St. Thomas, Ont., office of Timken Roller Bearing Co., Canton, O., has been appointed district manager of the Moline, Ill., office. Robert L. Williams has been appointed district manager St. Thomas, Ont., office.

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CONCRETE CUTTER
for only **\$580⁰⁰**

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DI-MET SEGMENTED DIAMOND WHEEL—Available in two types: **STANDARD** for hard, dense, cured concrete. **SPECIAL** for green, uncured concrete and asphalt.

FEATURES

EASY HANDLING—3 wheel design with light-weight alloy castings.

BIG BLADE CAPACITY—Utilizes from 8" to 18" diamond wheels. Cuts to 3 1/2" depth with 12" wheel.

SPLIT, HINGED BLADE GUARD—For cutting close to curbs, etc. 12" standard, 18" optional equipment.

POWERFUL ENGINE—Full 13 1/2 h.p. Wisconsin Model TF gives a surplus of power for every cutting requirement.

PRESSURE COOLANT supplied through external hose connections.

INSTANT BLADE DEPTH ADJUSTMENT with hand-wheel and screw.

SLOTTED BLADE COLLARS—Powerful coolant ejection completely flushes blade and kerf.

HUSKY SPINDLE—Mounted in Dodge S.C. self-aligning ball bearing pillow blocks. 1 1/4" single end arbor with keyway.

FELKER DI-MET MODEL 135

Here's your answer to all run-of-the-mill concrete cutting jobs at a new low in price! This light-weight 3 wheel Felker DI-MET machine is specially built for all those jobs where a big heavy-duty machine isn't necessary... Use it for cutting **CONTRACTION JOINTS, CURBINGS, DRIVEWAYS; FOR INSTALLING UTILITY POLES; FOR TRENCHING, PATCHING, ETC!**

Now you can own a genuine Felker DI-MET Concrete Cutter incorporating features resulting from years of experience in the industry—built by the **only** concrete cutter manufacturer who makes his own diamond abrasive blades!



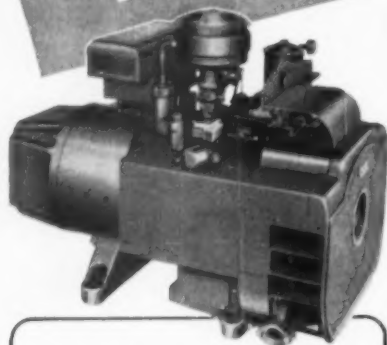
FELKER MANUFACTURING CO.
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World's Largest Manufacturer of Diamond Abrasive Cut-Off Wheels and Equipment

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On large construction jobs where wattage requirements for power tools are high or where floodlighting of extensive work areas is essential, the Onan 10CW delivers all the electric power you need.

Before you buy another electric plant for any purpose, take a good look at this new low-cost powerhouse! Also available in 5,000-watt capacity.

Write for detailed specifications.

- ★ Twin-cylinder, 4-cycle, horizontally-opposed, air-cooled engine
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**River gravel separated by
"heavy media" method**

First commercial production in this country of river gravel by the heavy media separation process has been announced by Keystone Division of Dravo Corporation, Pittsburgh.

Designed to improve the quality of river gravel for use as aggregate for concrete, the process removes by separation objectionable particles of "soft" gravel, porous gravel and foreign materials. Prior to tests of the heavy media principle, mechanical methods of scrubbing and pulverizing had been attempted for years, with high maintenance costs and only partial success.

The new process, which had previously been employed successfully in other fields, consists of placing the feed material—gravel dredged from the Ohio River—into an artificial heavy liquid made up of finely ground material kept in suspension in water. By varying proportions, a resulting liquid of any specific gravity between 1.0 and 2.5 can be maintained. All substances in the feed of lower specific gravity will float while heavier particles sink.

To retain the flexibility of its floating sand and gravel plants, Dravo designed and constructed a separate hull to carry the necessary equipment for the process. The plant is fed by a conveyor belt extending from the normal point on the dredge to a feed hopper at the top of the new plant.

The plant was placed in operation in April, 1952. While further tests will be conducted to verify results to date, considerable improvement in the quality of gravel has been noted. An important feature of the process is that it permits dredging for gravel in areas previously considered worthless because of contamination by coal and other deleterious material. The project promises much for the producer of gravel who is now forced to work the less desirable gravel deposits, notes a Dravo spokesman.

**Canada expects record
road building year**

Canadian governments plan to spend \$415 million on roads and streets in the current year, C. W. Gilchrist of Ottawa, managing director of the Canadian Good Roads Association told members of the Canadian Association of Equipment Distributors at their annual meeting at Ottawa, April 14.

The greatest portion of this amount, \$382 million, has been budgeted by provincial governments, Mr. Gilchrist stated. The remainder is the federal government's share of the Trans-Canada Highway and estimated expenditures by municipal governments. The total does not include funds budgeted by Ottawa for park roads and mili-

tary roads, or money to be spent by private corporations for the construction and maintenance of forest and mining roads.

Mr. Gilchrist forecast that this year will be the most active in road building history and that provincial governments should be able to repair many of the existing deficiencies in their highway systems.

He warned, however, that if the nation is to meet the present critical inadequacies of highways and streets the present record level of construction would have to be maintained indefinitely.

Current industrial activity and the rapid opening up of new areas in the north was creating a steadily expanding demand for roads to link the new areas of the country with the old.

"To provide our present requirements and to meet the need for roads that will inevitably occur as Canada expands northward will tax all our energies and resources into the foreseeable future," he said.

Construction on the Trans-Canada Highway, although behind schedule, would pick up a lot of momentum this year, Mr. Gilchrist said. By the end of the construction season the big road should be nearly half-way completed in the prairie provinces. These three provinces expect to complete their section of the highway on schedule by 1956.

Motorola Appoints Mexican Distributor. Equipos Electronicos de Mexico, S. A., Luis G. Cuovas Medina, general manager, has been appointed a co-distributor of Motorola communications products in Mexico.

Schmus Promoted by Harnischfeger. George A. Schmus, traffic manager of Harnischfeger Corporation, Milwaukee, Wis., since 1937, has been promoted to manager of the Parts and Service Department.

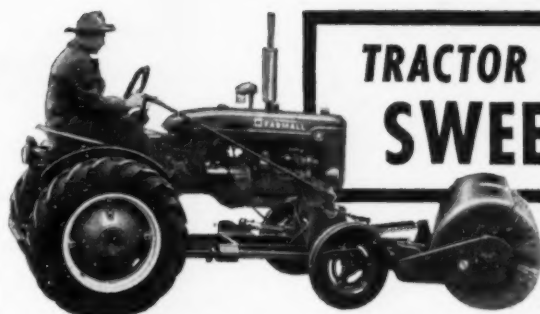
Granco Appoints Sales Engineers. Granco Steel Products Co., Granite City, Ill., has appointed the following district sales engineers: Charles E. Eck, Kansas City, Mo.; Olaf O. Roberts, Chicago; Fred B. Kallmayer, St. Louis, and F. Alan Tlarks, Dallas.

Brown Appointed General Sales Manager. A. C. Brown, Jr., formerly regional manager of the Air Reduction Sales Co., New York, N. Y., has been appointed general sales manager, with headquarters at 60 East 42nd St., New York, N. Y.

Allen Heads New Esco Office. Garland T. Allen, heretofore representative in the Portland, Ore., area, has been appointed sales manager in the new Esco branch office at 1455 South Second West, Salt Lake City, Utah.

Kuhn Made Vice President, Sales. J. C. (Jack) Kuhn, formerly vice president and director of sales of Morse Twist Drill and Machine Co., New Bedford, Mass., has been appointed vice president, sales, of Atkins Saw Division of Borg-Warner Corp., Chicago, Ill.

Davies Appointed Eastern Representative. W. L. Davies, formerly assistant to the director of National Production Authority in Washington, has been appointed eastern district representative of Athey Products Corporation, Chicago, Ill. Included in his territory will be Washington, D. C., Maryland and eastern Pennsylvania.



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Meili-Blumberg tractor mounted sweepers assure fast, clean "once-over" sweeping on any surface, because of their many exclusive features. They're built for heavy duty service, simple, strong and efficient. All shafts turn on anti-friction bearings, with all moving parts safety protected. The support frame is adjustable to compensate for brush wear and to follow surface contour. Sweeps a 5' path 30° to right. Hydraulic control — brush may be raised approximately 8" to clear obstructions. Broom may be disengaged when traveling.



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ROCKLAND HEAVY DUTY LAND CLEARING RAKES, manufactured for all tractors. Adjustable tooth spacing, replaceable wear points. Pusharms are optional. All connecting brackets are furnished. Extra attachments, removable brush rack, stumping head, pushblock.

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Loose Rock Fill

Challenges

Tunnel Drivers

Codell Construction Co. handles state highway project involving driving of vehicular underpass of steel liner plates under Louisville & Nashville Railroad in southern Kentucky

★ The new underpass is reported to be one of the largest structures of its type ever built

CULVERTS are traditionally meant to carry water, not vehicles. However, at Cawood, Kentucky (Harlan County), an 8 by 8 ft. box culvert was the only vehicular pass from a large coal mine at Three Point to the main road beyond the L & N Railway track. Road traffic was heavy and long trainloads of coal in this mining country would block grade crossings frequently and long.

As might be expected, vehicles would often get stuck inside the culvert or would scrape along the sides.

Storm periods stopped all movement except the water.

With such unsatisfactory conditions, an appeal was made to the Kentucky department of highways to provide a more dependable way of crossing the track. The railroad embankment is about 35 ft. high at this point. On the other hand, like many railroad fills, it was a rock fill with very little earth and would be difficult to cut through. For this reason it would have been impossible to drive piles for false-work to support the

track during construction. For the same reason, the cost of other types of construction would have been prohibitive.

The highway engineers came up with the idea of a steel tunnel of unprecedented size. Details were worked out with engineering representatives of the L & N Railroad and Armco Drainage & Metal Products, Inc.

Instead of the circular cross-section commonly used, an elliptical shape was adopted for greater strength. The size selected was a 16½ ft. vertical diameter by 13½ ft. horizontal diameter, using Armco tunnel liner plates of No. 3 gage. The individual galvanized steel plates are circumferentially corrugated and the corrugations are continuous through the longitudinal offset lapped joints. Bolts are on staggered lines through these longitudinal joints.

Structural Details

Each plate is 18 in. wide with flanged edges through which the bolts are readily placed from the inside. The plates are 37½, 44 and 50½ in. long circumferentially. Bolts in the joints are also placed from the inside. The bottom of the tunnel was placed 3½ ft. below ground line so that equivalent fill could be placed in the bottom to provide a roadway about 10 ft. wide. Length of the tunnel is 108 ft.

After the design details were worked out and specifications written, a contract was awarded to Codell

★ The old concrete culvert seen at right of the new plate-lined underpass





J. C. GORMAN ANNOUNCES SENSATIONAL PUMP.

Our GORMAN-RUPP engineers have designed and developed a diaphragm pump as sensational in its field as our GORMAN-RUPP Self-priming pumps are in the centrifugal field. The startling results outlined in our advertisement far exceed any comparable pump now available. This pump is so much better, in so many ways, that we consider all similar pumps and performance of same to be obsolete. We know that our claims seem fantastic—as much as 400% more pumping at 25 feet static lift, — the longer diaphragm life,—the lightness of weight,—the smooth easy flow. But these claims are facts! Facts that we absolutely guarantee to be true, and we will gladly demonstrate our pump at any time to prove these facts!



This new GORMAN-RUPP Diaphragm pump has been running nearly 400 hours under typical job conditions. It is operating at a 12 foot suction lift and a discharge head of 25 feet. The pump is operating smoothly and easily. Pumping volume is greatly increased, fuel consumption is less, suction line flow is smooth. Shock, strain and wear common in diaphragm pumping are virtually eliminated.

I would like to have more information on the GORMAN-RUPP Diaphragm pump.

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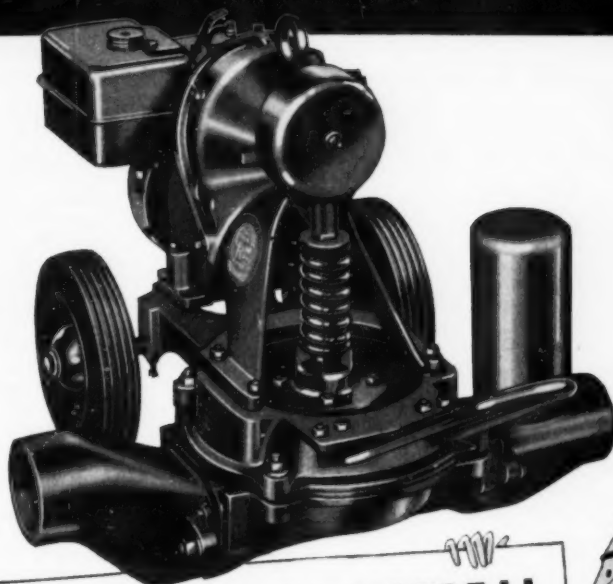
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City & State.....

☐ Literature ☐ See pump on job

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NEW! GORMAN-RUPP NOW OFFERS THE BEST DIAPHRAGM PUMP *ever built!*



ALMOST UNBELIEVABLE!!

But Here Are The Facts -

- ★ AS MUCH AS 400% MORE PUMPING -
at 25 ft. static lift
- ★ DIAPHRAGM LIFE INCREASED 10 TIMES!
- ★ ONE MAN HANDLING—Only 130 lbs. Job-to-Job
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WE CAN SUPPORT THESE CLAIMS!

You are invited to see this pump at work on the job, through your Gorman-Rupp distributor. It is absolutely guaranteed to outperform and outlast any 3-inch pump with single driven diaphragm, comparably powered, now on the market.

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Diaphragm drive rod spring cushioned on down stroke. Less shock! Less strain! Less wear! *EXCLUSIVE — another G-R First!*

Hook and tighten suction and discharge with hose connected. Easy! Quick! One man handling. *EXCLUSIVE — another G-R First!*

Numerous exclusive features entirely new in diaphragm pumps, under patent applications.



THE GORMAN-RUPP COMPANY
MANSFIELD, OHIO



★ How the tunnel looks today—a comfortable one-way road adequate for traffic needs

Construction Co., Inc., of Winchester, Kentucky. Work was started in April, 1952.

Ordinarily in a tunnel of this size, either a pioneer tunnel is first driven or the work is carried on in two lifts, with the top generally being built first. Here, however, the entire opening was excavated and the liner plates assembled and advanced a ring at a time. Because of the predominantly rock nature of the fill, excavation for each plate was a tough job. Rocks of all sizes and shapes required chipping, or drilling and blasting. This called for great skill to prevent the fill from settling or exerting unduly great pressure on the plates already installed.

Interior views of the finished tunnel show that the contractor did a competent job of driving this difficult tunnel. There is no visible distortion from the elliptical shape and the alignment is excellent.

How Plates Bolted

Compressed air hammers and drills were used for the excavation. All excavated material was removed in a front-end loader and wasted on the slope of the fill. The strong liner plates were light enough for one man to carry, but two men did the holding in place and bolting, using ordinary end and ratchet wrenches.

When all the liner plates were in place, the voids or cavities on the outside were filled by pneumatically forcing a portland cement grout (1:4 mix) through threaded grout holes provided in the top and side plates at intervals of 3 to 5 ft.

A granular fill of crushed rock was then placed in the bottom of the tunnel and surfaced with a bituminous hot-mix, 4 in. thick.

To protect vehicular traffic as well as the sides of the tunnel, a line of Armco Flex-Beam guardrail was bolted on each side at a height of 24 in. above the roadway. This was painted white. Since the tunnel is short, no artificial lighting is necessary.

Traffic is now using the new one-way roadway and finding it a great

improvement over the old box culvert. It solves the traffic problem so well that this type of construction offers many possibilities for underpasses under railroads and main highways. It can be done at a fraction of the cost of bridge-type underpasses. Where traffic on the secondary road is heavy enough, a twin tube could still be an economical answer.

Dan Cometto was foreman for Cordell Construction Co. His crew averaged 5 men. The Kentucky State Highway Department drew up the plans under the supervision of Bridge Engineer of E. D. Smith. J. C. Nichols, Bridge Engineer for the L. & N. Railroad, reviewed and approved the plans. The job was inspected by both organizations. Armco Drainage & Metal Products, Inc., was represented by E. T. Cross and A. M. Snyder.

Clyde W. Wood Is Dead

Clyde W. Wood, 62, founder of Clyde W. Wood, Inc., general contractors, and Wood Manufacturing Co., manufacturers of road building equipment, both of North Hollywood, Calif., died suddenly March 31.

Born in Iowa in 1890, Mr. Wood came to California in 1910, and to Los



Clyde W. Wood

Angeles in 1935. In the general contracting business for more than 30 years, he constructed highways, ca-

nals, dams, bridges, tunnels, and airports throughout California and the West. Major projects in which Mr. Wood participated included those for the Los Angeles Metropolitan Water District, the State of California, U. S. War Department, Bureau of Reclamation and the Corps of Engineers, and others. He was one of the joint venture builders on Shasta Dam.

Mr. Wood is survived by his wife M. Mable Wood, four sons, Frank, Stanley, Wallace and Roy, one brother and four sisters. Both the construction and manufacturing business will be carried on under the supervision of the sons now active in the business.

North Carolina Route

(Continued from page 75)

od of vibration generally used. A pan type surface vibrator was used.

The volume of concrete resurfacing was established from the number of batches multiplied by the volume of



★ Inspector Fulghum tests slump with a Kelly Ball. Note consistency of concrete, which was later vibrated

each batch. The volume of a typical batch was determined by the so-called "bucket yield test" based on the actual weight per cubic foot of freshly mixed concrete. The total batch weight was calculated as the sum of the weights of all materials, including water. The weight per cubic foot was determined in accordance with the Standard Method of Test for Weight Per Cubic Foot, Yield Air Content (Gravimetric) of Concrete (ASTM Designation C 138). Determinations were made at intervals of 250 cu. yd. or oftener.

Coarse aggregate size for concrete pavement was North Carolina No. 3 type, meeting the following specifications:

Sieve Size	Per Cent Passing
1 1/2	100
1	90-100
1/2	25-45
No. 4	0-10
No. 8	0-5

Only one size coarse aggregate was required, with a specific gravity of 2.80. Membrane curing material was used, applied at the rate of not less than one gallon for each 200 sq. ft. with an approved mechanical spraying device.

R. P. Dowtin was resident engineer and T. R. Fulghum inspector on this project.



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WHAT'S NEW...

in Construction and Road Building Equipment, Materials and Supplies

On bound-in post card please circle number of item on which literature or more information is desired. The card is provided for your convenience in making inquiry and in obtaining catalogs or additional information. Card works for both advertising pages and reader items.

Just fill in your name, address, and title of your job, then circle the item number and drop post card into outgoing mail. No stamp is required.

New PMCO Speed-Grader Line Announced

A newly-engineered speed grader line, announced by Pettibone Mulliken Corp., is a completely new product based on continuous and grueling performance tests. The sizes now available are the 65 HP, two 100-2 HP, and the 107.8 HP.



PMCO New 1953 Speed Grader

The features claimed for the graders include: Full shock-proof hydraulic control; finger touch power hydraulic steering at no extra cost; no creepage during accurate, fine grading—no adjustments needed; a moldboard that swings easily with a full load; large front wheels—front and rear interchangeable, rims and tires at no extra cost. The frame is twin I-beam box section construction. The moldboard is standard pin type and can be shifted left or right by removing one pin (hydraulic side shift optional). The circle is solid cast steel (alloy steel casting).

For additional information circle Number 2 on inquiry card.

New GMC 270 Cu. In. Truck Engine

A new GMC 270 cu. in. truck engine incorporating all the latest engineering advances returns to the GMC medium duty truck line in a 2½-ton model. Successor to the old GMC 270 of both commercial and World War II 6 x 6 "Workhorse" truck fame, the new engine, of 130 hp, is in the new GMC model 400-27, rated at 18,000 lb. G.V.W. and 30,000 lb. G.C.W. The horsepower of the new engine not only has been increased 11.3 percent over the former 270, but the compression ratio has been stepped up as well, from 6.75-to-1 to 7.5-to-1, standard grade fuel still being used. The new model has optional wheelbases of 137, 149, 161, 179 and 197 in., integral cast-spoke type wheels, 8.25/20 10-ply front and dual rear tires with 9.00/20 10-ply tires optional, and optional, body types of 9- or 12-ft. platforms or stakes. The front axle is rated at 4,500 lb. capacity while the rear axle is 15,000 lb.

For additional information circle Number 11 on inquiry card.

Portable Asphalt Dryer For Moto-Patcher

A new portable asphalt dryer is now in production by Hetherington & Berner, Inc. Developed especially for use with the H & B Moto-Patcher, the dryer has a drying capacity of up to 10 tons per hour. Aggregate feeding is by rotary elevator from truck, or hand feed. Drum is 8 ft. long and 30 in. in diameter. The fuel oil tank has a capacity of 40 gal., and the oil burners are low pressure air-atomiz-

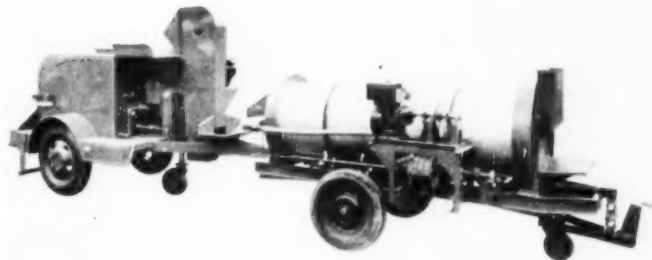
Portable FM Radio Set Weighs Less Than 10 Lb.

A new-type portable FM radio receiver-transmitter—weighing less than 10 lb.—will soon go into production at the Bendix Radio Communications Division. Designed to operate in the 152-174 megacycle band, the unit provides one watt of radio frequency output and can be supplied for communications on either one or two channels. An important feature of the Bendix MRT-9 is the "adjacent channel selectivity" characteristic which eliminates interference from transmissions on adjacent channels. The pack-set also employs a "power on" warning device which sets off a tone signal should the operator forget to turn off the power switch when the set is not in operation. The Bendix MRT-9 can be furnished with a dry cell battery pack, a wet cell pack, a special six-volt vibrator pack for operation from automobile batteries, or a 115-volt power pack.

For additional information circle Number 16 on inquiry card.

ing. The power unit is a Briggs & Stratton Model 23R6 with reduction gear, and Viking fuel pump. Ball bearings and roller chain are used throughout. The unit is readily attachable to any standard make truck with towing hitch. The landing gear is of the retractable swivel type with 3:50 x 6—4 ply tire and adjustable leveling device. Running gear is two wheel single axle with leaf springs. Tire size 6:50 x 16, 6 ply.

For additional information circle Number 1 on inquiry card.

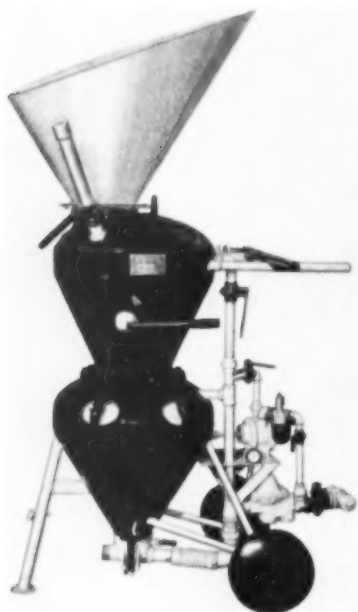


H & B Portable Asphalt Dryer

WHAT'S NEW ...

New Model Blastcrete Gun Completely Redesigned

The new Model PM-1 Blastcrete gun of Blastcrete Equipment Co., Inc. has been completely redesigned to provide for easier, faster loading, better control of material flow and air pressure and to meet the ASME Code for pressure vessels. A new slide valve in the loading



Model PM-1 Blastcrete Gun

chamber makes for easier and faster loading. The new feed flow control makes it possible to adjust material flow to any desired amount or to cut off material instantly when free air is desired and to blow out lines. The air pressure can be controlled to any desired degree. The new Blastcrete Gun handles materials with up to 6% moisture, eliminating the necessity of protecting materials against normal atmospheric moisture. It is claimed to place 1 to 5 cu. yd. per hour, or approximately 1½ cu. yd. per hour per 100 cu. ft. per minute of air. It is stated the Blastcrete gun handles all cementitious materials for construction and all refractory materials as well as many lightweight aggregates.

For additional information circle Number 5 on inquiry card.

Engine Built for Liquefied Petroleum Gas

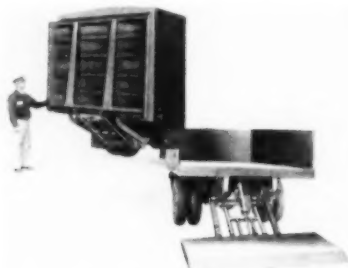
A new and smaller Gold Comet engine, designed and built specifically for liquefied petroleum gas (LPG) has been announced by Reo Motors, Inc. The new power plant, with a 255 cu. in. piston displacement, is the second LPG engine put on the market by Reo. The company entered the natural gas field last year

with a 331 cu. in. Gold Comet engine. The new engine is available as an option in Reo's Model F-20 truck series. It develops 100 hp at 3400 rpm and 182 ft. lb. of torque at 1600 rpm. The 255 cu. in. LPG engine, like other Reo Gold Comet power plants, is a 6-cylinder, overhead valve engine with unusual parts interchangeability. It has replaceable cylinder sleeves, integral intake manifold and a 3½ in. x. 4½ in. bore and stroke. The F-20 is equipped with a 54.6 gal., cylindrical fuel tank for LPG operation. The 255 LPG engine is also available as a complete engine kit, including all mounting brackets and necessary accessories, for installation in other makes of trucks. In addition, a conversion package has been prepared to change the 255 gasoline engine into an LPG unit.

For additional information circle Number 15 on inquiry card.

New Lift Gate Has Only One Control Lever

A new model lift gate with up to 4,000 lb. capacity, added to the line of Anthony Co., has a single lever control that utilizes the power of the single lift cylinder both to lift a load and to power close the gate. The new design eliminates one or more extra cylinders, valves and many parts. "Safetymestic" control stops gate



New Model 146 Lift Gate

instantly should operator for any reason remove his hand from control lever. Weighing less in total weight, design imposed less weight on rear of truck. New all-steel platform design gives deluxe appearance to "General Purpose" and "Ramp" style models.

For additional information circle Number 17 on inquiry card.

New Reflective Curing Paper for Concrete Pavements

Recent tests proved the need for a curing medium which would prevent excessive heat on the slab surface as well as retain sufficient moisture during the early period of hydration. As a step in this direction, The Sisakraft Co. has developed a new curing blanket. This special reinforced curing paper is bleached white on one side to reflect solar heat which, when applied to the slab, will bring more into balance these temperature variations. It is claimed that this new curing paper will produce the best

curing results at the lowest possible per square yard cost. These Sisakraft blankets will be available in any width up to 26½ ft. It is stated that under ordinary job conditions and a 72-hour curing period, the blankets can be re-used a minimum of 15 times.

For additional information circle Number 18 on inquiry card.

Two New Scrapers Added to Wooldridge Line

Introduction of two new high-speed self-propelled Terra Cobra scrapers, the TH-B90, with heaped capacity of 11.0 cu. yd., and the TH-B110, with heaped capacity of 13.0 cu. yd. has been announced by Wooldridge Manufacturing Co. The



Model TH-B90 Terra Cobra Scraper

standard 142 series has a heaped capacity of 17.5 cu. yd. Both new rubber-tired models incorporate the same basic design and operating characteristics as the larger machines, including positive hydraulic steering, air operated power control, "boiling bowl" loading, positive roll-out ejector and heavy duty construction throughout, with many components interchangeable with the larger models. Model TH-B90 is equipped with a 150 hp Cummins diesel engine, and has capacities of 9.0 cu. yd. struck, 11.0 cu. yd. heaped. The TH-B110 utilizes a 180 hp Cummins diesel, and is rated at 11.0 cu. yd. struck, 13.0 cu. yd. heaped. All 142 series models are powered by 225 hp Cummins diesels, and are rated at 14.0 cu. yd. struck, 17.5 cu. yd. heaped.

For additional information circle Number 10 on inquiry card.

Electrode for Rebuilding Carbon Steel and Alloy Steel Parts

A new electrode recently marketed by Stooddy Co. under the name Stooddy Build-up has been developed with the sole idea of providing the exact properties necessary in a material used for rebuilding carbon steel and alloy steel parts—sound deposits, high tensile strength, toughness and resistance to cold flowing. As an underbase it is generally recommended for such parts as drive sprockets, churn drills, shovel drive tumblers and house rolls, tractor rollers and idlers, tool joint shoulders and clutch jaws.

Stooddy Build-Up is an extruded alloy-coated electrode designed to produce an alloy steel deposit of consistent medium hardness of 29-31 Rockwell C under normal conditions. Deposits are affected by

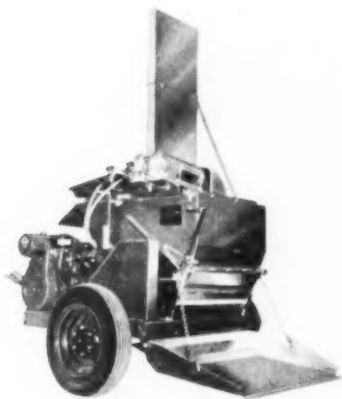
WHAT'S NEW ...

heat treatment and will react to abnormal temperature ranges like any other alloy steel. While Stooddy Build-up is not a hard-facing alloy and not intended for such applications, it has certain limited uses as a final overlay on equipment where impact is the principal wear factor—steel shafting, gears and tractor rails. Deposits are machinable with high speed tools.

For additional information circle Number 23 on inquiry card.

New Multi-pug Asphalt Mixer

A new multi-pug asphalt mixer, the HTD-B, added to the line of portable asphalt mixers of K. E. McConaughay, is claimed to be especially suited to hot or cold patching operations in any season



HTD-B Multi-Pug Asphalt Mixer

under wet or dry conditions. Precisely engineered, rigidly constructed and thoroughly tested in handling on-the-job mixtures of asphaltic concrete, sheet asphalt, sand asphalt, or mastic asphalt at remarkably high rates. Other features claimed for the mixer: reactivates and heats stock pile mixture up to 10 tons per hour; prepares cold asphaltic mixtures up to 10 tons per hour; prepares hot asphaltic mixtures up to 5 tons per hour; dries various types of wet aggregates quickly and thoroughly; removes both moisture and solvents from bituminous mixtures; processes tars, paving asphalt, cut-back asphalts and emulsified asphalt.

For additional information circle Number 6 on inquiry card.

Stainless Steel Coating Developed in 10 Colors

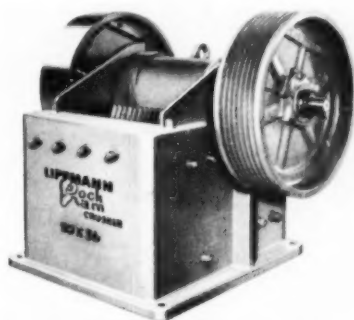
A new line of products now available under the trade name Steelast, announced by Steelcote Mfg. Co., has come out of the research work done on stainless steel coating. The formula for Steelast products is basically the name as that of stainless steel coating in that both use a vinyl plastic vehicle, the primary difference being that a change of pigment makes possible the manufacture of all

colors including: black, white, gray, ivory, green, red orange and yellow. Steelast at stated to produce the toughest type film of any ever tested in Steelcote Laboratories, impervious to moisture, resistant to most chemicals, and odorless and non-toxic when dry. The uses in which Steelast is claimed to offer advantages over ordinary coatings are protection and finishing of metal surfaces on original equipment, and maintenance of machinery, pipes, tanks, duct work and metal building materials, indoors and out. Steelast can be sprayed, brushed or dipped.

For additional information circle Number 24 on inquiry card.

New Line of Jaw Crusher Announced

A new line of jaw crusher, to be known as Lippmann Rock Ram crushers, has been announced by Lippmann Engineering Works. This machine is a fabricated type and contains the mechanical features of the Lippmann Grizzly-King crusher. Whereas the Grizzly-King sizes are 12 x 36, 15 x 36, 18 x 30, 18 x 36, 24 x 36, 30 x 42, and 36 x 48, the Rock-Ram will be available in sizes 10 x 16, 10 x 20, 10 x 24, 10 x 36, 15 x 36, 20 x 36,



New Lippmann Rock Ram Crusher

and 30 x 36. Tests on the Rock-Ram are stated to indicate it will live up to the high standard set by the Grizzly-King.

For additional information circle Number 29 on inquiry card.

New Scrapers Have Lever Action Design

A complete line of improved scrapers has been announced by the Euclid Road Machinery Co. In addition to its standard 15.5 cu. yd. scraper and 18 yd. twin-power unit, Euclid is building a new 12 yd. model. All three models feature the introduction of a "lever action" design used in connection with an improved and simplified hydraulic system.

Levers replace cables and sheaves formerly used to multiply the stroke of hydraulic jacks actuating the bowl lift, apron lift and roll-out ejector. The jacks for the bowl lift and apron lift are mounted vertically and have been incorporated in the torque tube. This, together with the lever arrangement, lowers the height of the scraper nearly 2 ft. Approximately 90 ft. of control cable is eliminated.

Jacks are controlled by an improved and simplified hydraulic system. Various components of the system have been grouped together in a hydraulic package placed on the front of the tractor. The pump is mounted internally in the hy-



New Euclid Scraper

draulic tank, simplifying piping and eliminating the use of suction lines. Controls are faster acting and greater accessibility for servicing is provided. Two lever action hoists raise the bowl to a maximum height of 28 in. The apron is lifted by a hoist and lever connected to the apron by 11 ft. of cable. This is the only cable used on the scraper. Both the apron and ejector can be operated together for high speed spreading. The lever principle is also used to operate the roll-out ejector.

For additional information circle Number 13 on inquiry card.

New 20-Ton Capacity Dump Body Announced

A new 20-ton capacity tandem axle straight bed dump body has been announced by The Galion Allsteel Body Co. Known as the Galion "Morgantown" this body is constructed of 10 gauge steel with a full size cab protector. Overall body length is 20 ft. It is 84 in. wide at the floor level and 95½ in. wide at the point where side boards are inserted. Ends are 52 in. high with boxtype corner posts which anchor two 11-in. removable



Morgantown Dump Body

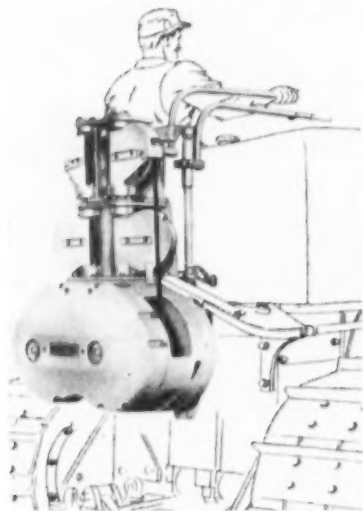
steel side boards. Body is amply reinforced by 6 steel V-type braces and has a double-acting tailgate 35 in. high, with cast steel and malleable iron heavy duty hardware. Dumping is handled by a Galion Model 77353 hoist. This consists of two 7-in. twin ram 3-stage twin telescopic cylinders. Rated hoist capacity is 20 tons.

For additional information circle Number 8 on inquiry card.

WHAT'S NEW . . .

Power Control Unit Features Higher Capacity, Easier Control

A new power control unit designed for high capacity and easier control, with adequate line pull for even the most severe operating conditions, has been announced by The Baker Manufacturing Co. The new rear mounted Baker unit, the PCU-75, combines a multiple disc



New Power Control Unit, Model PCU-75

clutch with a rugged, simplified brake design. The new clutch is stated to actuate within a shorter distance than other-type clutches, and can be engaged or disengaged with a lever travel of only 5 in. Fewer adjustments are stated to be required with the multiple disc design, with wider-spaced adjustment periods. The Baker PCU-75 brake system features single-point adjustment, with tension changes made from one adjusting bolt. The simplified design is stated to permit faster braking, faster release action, easier for the operator to control. Hand levers on the PCU-75 are designed for horizontal swing-action, and may be adjusted by the operator for length, angular position and height. Line speeds are stated to reach 710 fpm with full draw at 1700 rpm. Capacity is 225 ft. 7½ in. cable. The new Baker PCU-25 is designed for use on HD-15 and HD-20 Allis-Chalmers tractors, and on any other tractors of comparable horsepower.

For additional information circle Number 7 on inquiry card.

New Welder Has Wide Variety of Applications

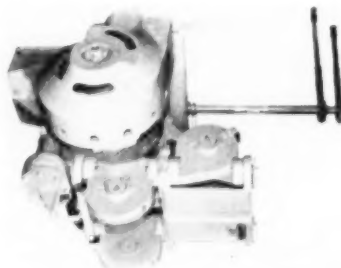
A new 400-ampere single-phase A-C welding transformer with a 60 per cent duty cycle has been announced by the General Electric Company's Welding Department. Designated as G-E Type WK40K, the new welder provides a current range of 40 to 500 amperes, and can be used with

a variety of electrode sizes for repair, maintenance, and construction work. According to G-E engineers, the new transformer not only assures quick starting, but also incorporates arc-stabilizing capacitors which make it easier for operators to strike and maintain an arc without popouts. This results in faster travel speeds, fewer "patch ups," and stronger welds, they said. The extra-wide current range is stated to allow the use of this one machine for a wide variety of applications, from light-duty, low-current sheet metal jobs to heavier-duty, high-current industrial work. A range switch enables the operator to change quickly from high to low currents or vice versa.

For additional information circle Number 25 on inquiry card.

New Cable Control Uses Simplified Power Train

Especially designed for use with tractors of 130 hp or more, an entirely new extra heavy duty cable control unit has just been introduced by Wooldridge Manufacturing Co. Designated as the Wooldridge Model WD-2, it is said to employ a simplified power train comprised of only one worm gear and wheel. Double drums of 10 in. barrel diameter are actuated by multiple disc clutches and large surface self-energizing brakes, said to provide fast, smooth action under all operating conditions. Full universal



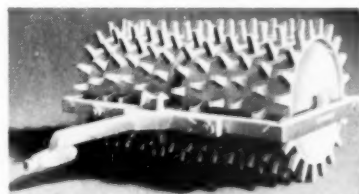
Model WD-2 Cable Control Unit

fairleads and large sheaves are claimed to provide longer cable life and easier reeving. Compact design is said to permit mounting close to tractor for better balance and protection against damage. Line speed at 1000 rpm input is rated at 343 ft. per min. with bare drum, 542 ft. per min. with full drum. Each drum has a cable capacity of ½ in. x 235 ft. or ⅝ in. x 186 ft. Extra ruggedness is claimed with cast alloy steel case and heavy duty design throughout. The unit is designed for use with Caterpillar D-8, Allis Chalmers HD-20 and HD-19, and International Harvester TD-24, and may also be adapted to certain other large tractors. The new Model WD-2 covers the range above that of the Model WE-2, used on tractors under 130 hp.

For additional information circle Number 12 on inquiry card.

New Extra Heavy Duty Tamping Roller

A new extra heavy duty tamping roller has been announced by Southwest Welding & Manufacturing Co. This new model 2D10-WS features twin drums with solid wedge-type feet. When loaded with sand it is stated to exert a tamping pressure of 1250 psi. Water ballast may be used for lighter pressures. Like other rollers produced by this company, the new



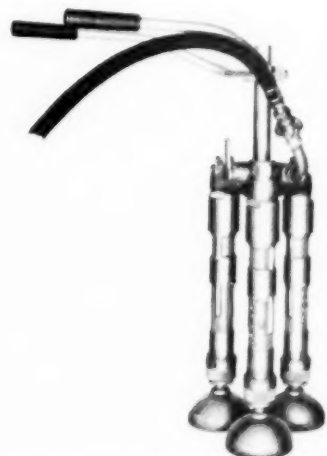
New Tamping Roller

wedge-foot model has an oscillating yoke which allows a full tamping effect on uneven ground. Drum is 5 ft. diameter by 5 ft. long.

For additional information circle Number 21 on inquiry card.

New Tamper Has 3 Tampers on a Common Head

A new hand tamper, announced by Cleveland Rock Drill Division, consists of three standard No. 11 back fill tampers assembled to a common head. In their common head, the air control valve is incorporated and is easily accessible to the operator. Swivel air inlet is provided for operator's convenience to keep air hose away from ground.



Le Roi Cleveland TTH Triple Hand Tamper

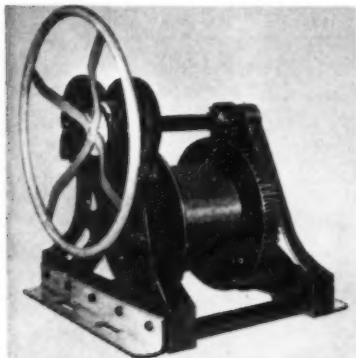
Long handle bars keep operator away from tamper to avoid injury. Specifications include: Height 40 in.; Width 14 in.; weight 135 lb.; butt size 5¼ in.

For additional information circle Number 14 on inquiry card.

WHAT'S NEW ...

Heavy-Duty Hand Winch Designed for Reversible Use

A new 15-ton heavy-duty hand winch, announced by Beebe Bros., can be installed so that the operator always stands on the safest or most convenient side. Optional steel fastener brackets permit speedy flush welding to steel floor or plates, yet allow easy removal of the winch when necessary. Allowance has been made for varying cable requirements by providing two optional drum



Reversible 15-Ton Heavy-Duty Hand Winch

diameters of 10 and 14 in. respectively, with corresponding 6- and 4-in. flanges. Three speeds of 4:1, 19:1 and 109:1, with a patented instant gear change, give speed when wanted, power when needed. Positive two-way dogs guarantee that no line slack will ever develop. By placing all gearing near the top of the winch, the designers were able to provide an exceptionally low drum center which adds to the strength of the winch, while at the same time give ample clearance for either hand wheel or crank. No costly substructures are necessary to provide hand wheel or crank clearance.

For additional information circle Number 9 on inquiry card.

New High-speed Stockpile Loading Attachment

A new high-speed loading attachment has been developed by Athey Products Corporation for their model 3 Force-Feed Loader. It is stated that the new auger-



Force-Feed Loader with Bulldozer Moldboard Auger Feeder

type feeding mechanism will pour forth a constant stream of free-flowing stockpiled material at volume rates of up to

10 cu. yd. per minute. Designated the "Bulldozer Moldboard-Auger Feeder," the attachment is available either as original equipment on loaders shipped from the factory or as an attachment which can be installed on machines already in the field.

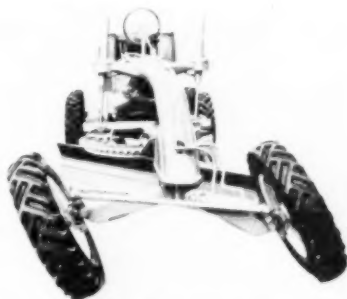
The attachment includes a bulldozer type moldboard which extends across the loader to provide a 90 in. width of gather and has positive hydraulic down pressure on reversible cutting edges. A special feature of the "Bulldozer Moldboard-Auger Feeder" is the side boards at each end of the moldboard. These sideboards may be reversed, as shown in the illustration, for loading from window or set as shown by the dotted lines for loading from stockpiles. When set for stockpile loading the sideboards prevent material from building up in front of the front wheels.

For additional information circle Number 22 on inquiry card.

New Accessories Increase Versatility of Grader

Front wheel lean and power circle turn are now offered as optional equipment for the Allis-Chalmers 40 HP, 8,800 lb. tandem-drive Model D motor grader. These new accessories increase the versatility of this grader so that it meets more work requirements in this class grader than ever before.

Mechanism for the front wheel lean includes axle and steering knuckles, ad-



A-C Model D with Front Wheel Lean and Power Circle Turn

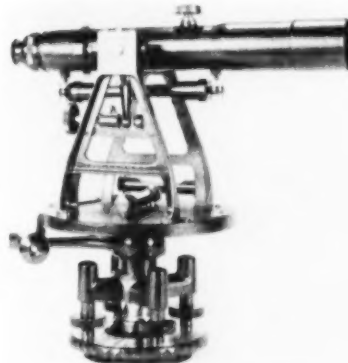
ditional tie bar, and wheel lean cylinder. The wheel lean has a range of 25 degrees each way, comparable in design to that in the 104 HP Model AD-40 motor grader in the line. This gives ample range for ditching and for counteracting side draft. Front axle has the same high arch for clearance as on the standard Model D—15 3/8 in. with 6.50-16 tires and 19 in. with 7.50 tires. Axle tilt is 15 degrees.

Wheels are leaned by moving the valve control lever. The power circle turn is operated by a hydraulic motor and reduction gear and includes a new circle. The new circle is designed to provide the same three-point mounting and provision for adjustment as on the standard Model D and other A-C motor graders.

For additional information circle Number 4 on inquiry card.

New Industrial Transit Has Many Applications

The Optoplane, a new industrial model of the Gurley precise transit for facilitating jig and fixture location and alignment, has been added to its line of transits by W. & L. E. Gurley. The Optoplane, developed in cooperation with aircraft plant engineers is stated to have



The Optoplane

numerous applications in many industries. Among these are the heavy construction, aircraft, automotive, and paper processing industries. Already in use by plane builders, the new Optoplane establishes the horizontal and vertical planes necessary in locating and setting up jigs for sectional assembly. Built to the precision of the best engineers' transits, the Gurley Optoplane permits jig alignment and coordination within tolerances of thousandths of an inch.

For additional information circle Number 3 on inquiry card.

2-Way Coupling for Air Pressure Shut-off

A new two-way coupling for positive shut-off of air pressure when disconnecting air hose connections is now being marketed by the Twinmatic Corporation.



Twinmatic Coupling

The couplings have valves which automatically shut off air pressure and eliminate the need to open and close air valves at the compressor tank.

For additional information circle Number 19 on inquiry card.

WHAT'S NEW ...

MANUFACTURERS' LITERATURE

Hoists for Scraper and Cableway Excavators

A new 28-page catalog containing full information on Sauerman hoists for operating power scraper excavators and storage machines, slackline cableway excavators and tautline cableways has been published by Sauerman Bros., Inc. The catalog is divided into five sections. Part 1 covers the hoists for scraper storage machines; Part 2 hoists for scraper excavating machines; Part 3 brake and clutch controls for the hoists; Part 4 hoists for tautline cableway machines; and Part 5 hoists for slackline cableway machines. In each section full descriptions of the hoists are given and illustrations of various models pictured. It is a very comprehensive and useful catalog on hoists.

For additional information circle Number 28 on inquiry card.

Preventative Maintenance Guide for Earthmoving Equipment

A simple and easily followed maintenance program, developed for Euclid earthmoving equipment, is described in a 20-page booklet published by the Service Department of the Euclid Road Machinery Co. Title is, "Euclid's Guide to Preventative Maintenance." The publication not only explains the operation of the program, but provides owners with a detailed outline of all points that should be checked at 100; 500; 1000; 2000; and 4000 hours of operation. All forms necessary for installing and operating the program are illustrated along with the maintenance check sheets used. These are patterned after those used in aircraft maintenance. Paper work can be taken care of in a few minutes a day and the program is easily installed or adapted to operations where a preventative maintenance program has already been established. Heart of the program is a control system which notifies the shop when regular servicing intervals are due, checks on whether or not the work has been done, and provides an easily kept record of repair costs, fuel and oil consumption, and equipment availability.

For additional information circle Number 29 on inquiry card.

Varied Applications of Lorain Cranes

A 12-page picture book showing the varied applications of its crane line on docks, barges and ships has been produced by the Thew Shovel Co. Full 8 in. x 10 in. pictures and short job descriptions make the book interesting and easy to read.

For additional information circle Number 30 on inquiry card.

Sanitary Landfill System of Disposing of Garbage

"Community Workers" is the name for Caterpillar sanitary landfill equipment in a new booklet (Form No. 30602) on the subject published by Caterpillar Tractor Co. Twelve vivid photographs illustrate this modern, final disposal method for refuse and garbage. The 8-page booklet points out that, in co-operation with federal, state and local authorities, cities large and small have developed the sanitary landfill system.

For additional information circle Number 35 on inquiry card.

Twenty Attachments for Caterpillar Motor Graders

A complete listing of 20 attachments for Caterpillar motor graders is now available in the booklet, "Attachments for your Caterpillar Motor Grader," published by Caterpillar Tractor Co. The 8-page booklet (Form 30663) carries pictures and discussions concerning the usefulness of the 15 attachments made by Caterpillar. Five other attachments are manufactured by others for use on Caterpillar graders.

For additional information circle Number 32 on inquiry card.

Deterioration of Diesel Engine Cylinders

An 8-page reprint, "Waterside deterioration of diesel engine cylinders," available from The International Nickel Co., deals with problems in water cooling of diesel engines, especially a "dynamic" pitting encountered in various services: marine, railroad, highway trucks, tractors and cross country gas line compressor stations. Reasons are given for failure of protective measures to stand up in service and certain steps are outlined that may be expected to provide effective remedies.

For additional information circle Number 33 on inquiry card.

Tamping Plugs Save Powder, Stemming Time

A means of cutting stemming time to seconds through the use of Quick-Seal tamping plugs is described in a new bulletin published by National Mine Service Co. According to the brochure, these plugs will save powder, provide more effective breakage and greatly reduce stemming time in tunnels, open pits, quarries, underground metal and non-metallic mining operations. In use, the following procedure applies: (1) Explosive charge is placed into borehole; (2) Quick-Seal plug is inserted into the hole against charge; (3) the wooden wedge is driven into the expanding part of the plug with a tamping stick; (4) when a ringing sound is heard, the wedge is as tight as it should be and the hole is sealed airtight. Shot is ready to fire.

For additional information circle Number 34 on inquiry card.

Controller for Traffic Signal Operation

A new two-color booklet describing General Electric's Type F controller for traffic signal operation has been announced by General Electric Co. The well illustrated 8-page bulletin, GEC-938, describes design features, applications, operation, construction, specifications, and prices of the entire Type F controller line. It also contains information on adjustable and fixed traffic signals and beacons.

For additional information circle Number 36 on inquiry card.

Link-Belt Speeder One-half Yard Shovel-crane

A 24-page catalog describing its 51 series of shovel-crane has been announced by the Link-Belt Speeder Corporation. The fully illustrated catalog No. 2428 covers Link-Belt Speeder's complete line of ½-yd. shovel-crane including the crawler-mounted LS-51, the truck-mounted HC-51 and the wheel-mounted MS-51 models. Photographs show the equipment under actual operating conditions. Included in the editorial material is comprehensive data covering the upper machinery, crawler, truck and wheel-mounted lower mechanisms for each model. The new catalog also includes a detailed section on the operation, features and advantages of "Speed-o-Matic" controls. Also pointed out is the full convertibility of the 51 Series shovel-crane which can be used as shovels, drag-lines, lifting cranes, clamshells, trench hoes and pile drivers.

For additional information circle Number 37 on inquiry card.

Data Sheets Cover Liquid Level Gages

Set of new data units, nine sheets covering complete line of liquid level gage valves for both tubular and flat gages, regular, offset and with union connections to gate, has been issued by Jerguson Gage & Valve Co. Complete specifications with illustrations showing cross sections, roughing dimensions, standard and optional connections are included.

For additional information circle Number 38 on inquiry card.

Stainless Steel Alloy Arc Welding Electrodes

A 20-page catalog on its complete line of Arcalloy stainless steel electrodes has been released by Alloy Rods Co. The catalog includes explanation of the two basic types offered: Lime coating for all-position welding with DC reverse polarity, and AC-DC for welding of chrome-nickel steels with all types of AC or DC welding equipment. Individual descriptions of the 23 regular analyses and special analyses of Arcalloy electrodes, weld metal properties, welding procedures, electrode analysis and color charts, current ranges, and A.I.S.I. type numbers are included.

For additional information circle Number 31 on inquiry card.

WHAT'S NEW ...

Guide Features Fundamentals of Brake Service

A new 44-page brake service guide for fleets announced by Raybestos Division of Raybestos-Manhattan, Inc., features the basic fundamentals of brake service, the uses of oversize blocks and roller cam followers and brake equalization for all popular brakes used on trucks, trailers and buses. In addition to information on popular brakes like the various Bendix, Ford, Lockheed, Wagner, Chevrolet Hucks and Timken, this new guide contains data on the Tru-Stop disc hand brake. Also included in the guide are comprehensive sections on vacuum systems, compressed air systems and air system maintenance.

For additional information circle Number 41 on inquiry card.

V-belt Catalog for Light Duty Applications

A new fractional horsepower V-belt catalog for use in servicing light duty applications has been announced by Raybestos-Manhattan, Inc., Manhattan Rubber Division. In this catalog belts are listed according to the new industry-standard numbering system. Various type machines are listed together alphabetically by company or trade names for convenience in determining the proper belt.

For additional information circle Number 39 on inquiry card.

Typewriter Speeds Up Statistical Typing

New speed and ease in statistical typing through the use of the 10-key tabulator electric typewriter is the subject of a new folder released by Remington Rand, Inc. This 4-page folder describes a faster way to perform columnar tabulation for billing and statistical work. Without removing her hands from the keyboard the typist can tabulate accurately from column to column, or to any desired position in relation to the decimal point by setting only one stop for each column and by using only one key for each tabulation. The 10-key tabulator is an all-purpose electric typewriter and meets every typing need.

For additional information circle Number 40 on inquiry card.

Chemical Brush Control on Rights-of-way

A progress report (Station Paper 12) on its 1952 field research on the use of chemicals for right-of-way clearance and maintenance has been released by Thompson Chemicals Corporation. The report covers the third year of research of the Thompson field staff on more than 3000 acres located in the Arkansas and Missouri Ozark regions. Both foliage spraying and basal bark application techniques are reported on, as well as the use of truck, tractor and knapsack sprayers.

For additional information circle Number 43 on inquiry card.

Toll System Equipment for Highways and Bridges

A pamphlet describing the equipment and its operation at Atlantic Beach bridge, Nassau County, Long Island, said to be representative of the latest design in toll system equipment, has been issued by The Electronic Signal Co. Included in the pamphlet is a complete glossary of modern toll equipment terms.

For additional information circle Number 41 on inquiry card.

Cable Control Unit for 130 HP Tractors

A new bulletin on its recently announced extra heavy duty cable control unit is available from Wooldridge Manufacturing Co. This unit, especially designed for use with tractors of 130 HP or more, employs a simplified power train comprised of only one worm gear and wheel.

For additional information circle Number 45 on inquiry card.

Materials Handling Equipment Constructed of Aluminum

A new catalog on lightweight materials handling equipment released by Tobey Manufacturing Corporation covers the complete line of Tobey materials handling trucks which are constructed entirely of aluminum and weigh from one-third to one-fourth as much as conventional wood or steel trucks. For example, a recent platform truck manufactured by Tobey weighs only 57 lb., yet has a load capacity of 2000 lb.

For additional information circle Number 51 on inquiry card.

Lift Gate has Single Lever Control

A brochure on its 4,000 lb. capacity lift gate has been issued by Anthony Co. This gate has a new hydraulic control system that uses a single cylinder to lift, lower and power close gate.

For additional information circle Number 42 on inquiry card.

Vacuum Switch Guards Industrial Equipment

New literature covering in detail the specifications, applications and installation of the Vac-On Switch, a recently developed vacuum switch designed to guard industrial equipment, has been issued by Jaycon Associates. The switch is a low-cost "watchman" device, designed to shut off an electric or gasoline motor driven pump (or similar equipment) operating on limited liquid source or vacuum preventing breakdown due to dry operation, or vacuum chamber leak.

For additional information circle Number 46 on inquiry card.

Aid to Contractors in Selecting Proper Piling

Comparative information on steel sheet piling manufactured by major steel companies is given in a 20-page catalog issued by L. B. Foster Co. To help the contractor in estimating a job, one section lists the number of piles required for various wall lengths. Included also are piling data related to circular and diaphragm-type cellular cofferdams, circular cofferdams, Z-piling and other connections, corner pieces, and specifications for piling sections. Pile extractors and pile hammers also are discussed.

For additional information circle Number 47 on inquiry card.

New Track Rollers for Cat D8 Tractors

A cut-away view showing the improvements in the new track-roller for Caterpillar D8 track-type tractors is featured in "Track Rollers" (Form 30738), a booklet recently published by Caterpillar Tractor Co. An interesting part of the book is a well-illustrated 2-page feature showing the five steps required in the production of track rollers, starting with the purchasing of top grade steel and carrying through to the rigid testing and inspection required for these parts. The 8-page booklet, printed in two colors, is illustrated with 12 photographs and a drawing.

For additional information circle Number 48 on inquiry card.

Air Vibration Equipment for Concrete Industry

A pictorial type 6-page catalog No. 106 on its air vibration equipment for the concrete and concrete products industry, issued by Cleveland Vibrator Co., contains practical ways in which various types of Cleveland air vibrators are being used. These include trucks, bins, hoppers, railroad cars, structural forms, concrete block machines, and other applications. Included is an engineering data sheet, on which the user can indicate details of his particular problem, in order to receive no-charge engineering recommendations.

For additional information circle Number 49 on inquiry card.

Hydraulic Control Earth Boring Machine

Sterling earth boring machines are illustrated and described in an 8-page catalog issued by Wyoming Valley Equipment Co. These machines have standard auger sizes ranging from 10 in. to 26 in., and depths from 7½ ft. to 15 ft. are available. The power plant is a Ford industrial 6-cylinder engine having 226 cu. in. displacement, 3.3 bore and 4.4 stroke. Fore and aft and hydraulic turn table mounting is made possible by hydraulic power supplied from a hydraulic pump.

For additional information circle Number 50 on inquiry card.

WHAT'S NEW . . .

CURRENT TRADE LITERATURE

Listed below are brief notes on bulletins, booklets, catalogs, brochures and circulars of particular interest to contractors and engineers. This current trade literature is yours for the asking. Just circle the numbers of the desired items on the Readers Service Card and mail. We will do the rest.

81 LUBRICATION GUIDE: Swan-Finch Oil Corporation. 16-page booklet containing useful information on the lubrication of tractors, trucks and road construction and maintenance equipment. Discusses Motul oils and greases. Tells what they are, their advantages, what they will do and how they should be used.

82 WIRE ROPE SLINGS: A. Leschen & Sons Rope Co. 64-page handbook on Leschen slings and fittings. Contains more than 100 illustrations showing standard wire rope slings, grommet slings and multipart slings; also charts showing calculations for determining the correct size of slings required, and correct sling angles in relation to loads.

83 TRAILERS: Talbert Construction Equipment Co. 24-page catalog covering line of low-bed trailers, dump semi-trailers and mobile crane mounts. Line includes removable gooseneck heavy duty trailers in 10-ton to 75-ton capacities and fixed and removable gooseneck trailers in 10-ton to 30-ton capacities.

84 CHOCKER SLING FITTINGS: Electroline Co. 4-page brochure shows typical applications for the new fitting. "How to use it" drawings explain how the fitting works—how the pivoting members fit securely around the wire rope. Cut away section shows the simple socket arrangement.

85 ROCK DRILLING EQUIPMENT: Ingersoll-Rand 40-page catalog illustrating and describing compressors, rock drills and air tools. Contains suggestions as to how compressors and tools may be combined for the most efficient and economical operation.

86 BATCHING PLANTS: Winslow Government Standard Scale Works, Inc. Two circulars, one on an aggregate batching plant for loading mixer skips, the other on the Winslow Binanbatch. The latter consists of either two or three storage bins with a weigh hopper and batching scale. Available in 23-ton and 40-ton bin capacities.

87 ROAD MATERIAL SCALE: Winslow Government Standard Scale Works, Inc. Circular on "Contractors' Special" road material scale. This is a portable truck scale that can be readily set up and placed in use within a few hours. It is built in four sizes: 15-ton, 18-ton, 20-ton and 30-ton capacities.

88 LOAD BINDERS: Lebus Rotary Tool Works, Inc. Catalog covering "Bulldog" load binders, snatch

blocks, tail chains, hooks, missing links, swivels and pull back spring. The binders are made with new flange type construction, and is claimed they will not spread or pull apart.

89 RUST PREVENTIVE COATINGS: Rust-Oleum Corporation. 6-page catalog features rust preventive coatings for construction and highway maintenance equipment. Included are specific applications, uses and instructions for brush or spray application.

90 HOSE FOR CONSTRUCTION: B. F. Goodrich Co. 4-page catalog on water hose describes types of water hose designed for specialized uses. These include long length, heavy duty hose for construction projects, road building and other high pressure uses; large diameter hose for high pressure water and air service in pile-driving operations, hydraulic bank grading, stripping and sluicing.

91 ENGINEERING INSTRUMENTS: C. L. Berger & Sons, Inc. 16-page catalog describing Berger engineering and surveying instruments. Included are sections on the general characteristics and optical systems of the instruments. Illustrated and described are 16 styles of instruments.

92 CONCRETE MIXERS: Gilson Brothers Co. 16-page catalog on non-tilt mixers with hydraulic lift skip and cable lift skip. Contains illustrations and descriptions of the mixers and their important features and specifications of nine models.

93 MALLEABLE CASTINGS: Belle City Malleable Iron Co. Circular citing principal reasons why malleable castings have continued to be a large and essential factor in the manufacture of mobile equipment and for machinery in general that is subject to stresses and strains. Many illustrations are included of typical parts made of malleable iron.

94 POWER SHOVEL OPERATION: Koehring Co., 32-page booklet containing a series of eight articles giving a detailed discussion of the basic principles of power shovel and crane operation, aided by numerous photographs, drawings, graphs and table, the capabilities of excavator and crane attachments are outlined and prescribed requirements given for most efficient operation.

95 WELDING MANUAL: Eutectic Welding Alloys Corporation. 56-page book "Truck and Car Fleet Maintenance and Repair Welding Manual." Contains over 86 step-by-step photographs, plus 25 diagrams and charts

to show quick, simple, money-saving ways of adding to the service life of any automotive vehicle.

96 TORQUE CONVERTERS: Twin Disc Clutch Co., Hydraulic Division. 12-page bulletin explaining how truck-type 3-stage hydraulic torque converter drives improves performance, prolong equipment life and prevent operator fatigue in heavy hauling.

97 CONCRETE BREAKER BALLS: Eagle Iron Works. 2-page bulletin on breaker balls, pile hammers and line weight. Standard sizes of breaker balls are listed. The pile hammers are pictured and described, and specifications are given for the line weight.

98 AIR TOOLS: Schramm, Inc. 8-page bulletin, containing illustrations, descriptions and specifications for rock drills, wagon drills, paving breakers and attachments, breakers, diggers and tools, tampers and vibrators, pneumatic saws, and miscellaneous tools and hose.

99 CLAY PRODUCTS: American Vitritified Products Co. 96-page catalog gives data on drain tile, sewer pipe and fittings, and perforated pipe. Lists A.S.T.M. and Federal specifications, and gives installation and purchasing hints.

100 2-6 HP ENGINES: The Lauson Co. 2-page circular picturing 13 models of engines ranging from 1½ to 6 HP. Brief information on each model is given.

101 ½ YD. SHOVEL CRANES: Link-Belt Speeder Corporation. 24-page catalog, fully illustrated, featuring Link-Belt Speeder 51 Series crawler mounted LS-51, truck mounted HC-51 and wheel mounted MS-51 models. Photographs show equipment under actual operating conditions. Comprehensive data on features of the machine are included, as a detailed section on the operation, features and advantages of Speed-O-Matic controls.

102 DIESEL ENGINES: P & H Diesel Division, Harnischfeger Corporation. 22-page booklet telling and illustrating the diesel story. Its main objective is to show just how simple the modern diesel is, and how easy it is to understand its operation.

103 WIRE ROPE RECOMMENDATIONS: American Cable Division, American Chain & Cable Co., Inc. 16-page booklet designed with a definite purpose in mind—that of recommending the "one best wire rope" for each major type of equipment used by contractors.

104 WIRE ROPE SPLICER: Quay Industries. Two circulars on wire rope splicing tools. The Torquemaster is a required item for Combat Construction and Cargo Handling Battalions of U.S.N. It is claimed that this tool makes possible a 50% savings in splicing man-hours.

WHAT'S NEW

in Equipment and Materials

(Supplementing the "What's New" section on preceding pages.)

Plaster-Mortar Mixer Has Winch Head

An inexpensive winch head attachment has been provided for Model 6-P plaster-mortar mixer of Kwik-Mix Co., Dept. R-S, Port Washington, Wis., a subsidiary of Koehring Co., Milwaukee, Wis. The attachment is optional and is said to provide sufficient lifting service to eliminate



Plaster-Mortar Mixer with Winch Head

the added expense of special hoisting equipment and labor. Mounted outside the mixing drum and revolving with the paddle shaft, the winch head can be applied either on the tilting or non-tilt mixer models. It has an average lifting capacity of approximately 250 lb., based on the anchoring ability of the mixer itself. Additional weight can be handled if the machine is securely anchored or counterweighted.

For additional information circle Number 52 on inquiry card.

New liquid bonding agent for road repairs

A new black liquid bonding agent for repairing, resurfacing and patching old roads has been introduced commercially after several years of exhaustive field and laboratory testing by Dasco Chemical Co. For best performance, Dasco Das-Top is mixed with crushed stone about 1/2 in. size and smaller. A coating of the mixture is then applied to any concrete or asphalt surface as a layer from 1/8 in. to 2 1/2 in. thick. Larger stones are recommended for filling deep ruts or holes. These should be topped with a layer of the mixture 1/2 in. thick. As Dasco Das-Top is a liquid, it mixes very easily either by turning with a shovel or in a small tumble-type concrete mixer. Used on a ratio of only 1 gal. of Das-Top to 300 lb. of stone, when properly mixed, 1 gal. will cover a surface of approximately 25 sq. ft. The stones should be thoroughly coated, avoiding excessive use of Das-Top. A sprinkling of sand or stone dust after the installation has been completed will speed hardening to a plastic top surface that is stated to be water and frost repellent.

For additional information circle Number 60 on inquiry card.

Does your preformed
wire rope give you
this kind of service?

"Measured by the ton mile, Hercules Red-Strand preformed outlasts others about two to one," reports one operations manager. Another operator testifies, "Our records show Red-Strand is considerably out in front of four other ropes."

Why HERCULES Red-Strand excels
What's the reason for such performance and praise?
In simple terms, it's because *higher-than-rated quality* in Red-Strand preformed delivers *longer-than-expected service*.

If you're not completely satisfied with your wire rope service, try Red-Strand preformed. You'll experience the difference too.

HERCULES®
Red-Strand wire
rope made by
A. Leschen & Sons
Rope Company,
St. Louis 12,
Missouri

In business only to
make wire rope
... better wire
rope ... since 1857



DISTRIBUTORS IN ALL PRINCIPAL CITIES



Rex-Spangler dual axle equipped truck, with better centered load

Dual Front Axle Permits More Payload, Greater Profit and Safety

Chain Belt Company has announced a major development, the Rex-Spangler Dual Steering Tandem Front Axle. Designed for the immediate problem of securing greater payload and safety in truck mixer operation, but offering far-reaching possibilities to the construction and transport industries, this unit has an additional steering front axle.

Trucks so equipped can carry more weight on the front end and thus carry more payload under existing state laws governing maximum axle loadings. Jack-knifing is eliminated, and advantages of

operator convenience and safety are offered that alone should make the unit of major significance, according to the Chain Belt authorities, who have spent years developing the unit.

The axle unit is available for 20,000 or 30,000 lb. combined axle capacity. Weight is 2,000 lb. over single axle assembly, or only a small fraction of the added payload weight made possible. The front axle of the unit is in the same position as the front axle of the truck before conversion. Turning radius of the truck is not altered. The front tandem spacing is 55 in.

The combination of a walking beam and bogie, together with other refinements, assure equalized weight distribution on all four front wheels and perfect steering, however rough the road. This achievement

distinguishes the unit from all previously attempted designs, including a European design which only partially achieves the equalizing suspension required under U. S. state laws defining tandem axles.

The truck gear box remains unchanged in the conversion, which is performed at an authorized conversion point. The unit makes possible about double the load on the truck front-end without need for power steering; booster type power steering easily installed on Pitman arm. Special rubber paraboloids are provided as means of suspension.

Exhaustive analysis, coupled with tests in service, indicates that the axle unit will pay for itself quickly through increased revenue loads. A typical example: a ready-mix truck owner has been hauling 5 yd. of concrete per truck, with axle loading of 32,900 lb. on the rear and 7,500 lb. front. Now that tighter load limit enforcement has brought fines for overload, the owner has reduced his pay-load to 4½ yd. of concrete, to keep the rear axle load within the 32,000 lb. maximum permitted by law. This means 4 yd. less concrete hauled in an 8-trip day, or 40 yd. less with his 10-truck fleet. By converting the trucks to dual front axles, permitting longer wheelbase and more centered location of the mixer, the owner finds that he can carry 5½ yd. of concrete per load without exceeding either the 32,000 lb. legal limit for the rear axle or the 49,000 lb. limit over-all. This increase of 1 yd. per load means 80 yd. more concrete hauled per day with the same equipment, or 22% more pay-load. Or the owner can haul the same yardage with correspondingly fewer trucks and operators. In other instances the pay-load increase is even more favorable.

For more information on the Rex-Spangler axle unit, circle Number 80 on the inquiry card and mail.

BLACKHAWK DUAL-ACTION DOZER



BLACKHAWK Half-Tracks provide extra traction, flotation, stability; combine with Dual-Action Dozer for low cost, highly efficient dirt and snow moving equipment.

**BETTER
FOR SO MANY
JOBS**

Backfilling — Removing Top Soil — Leveling — Landscaping — Terracing — Grading — Cleaning Ditches — Excavating — Snow Clearance — Light Road Maintenance

**BETTER
IN SO MANY
WAYS**

- ✓ Accurately controlled hydraulic down pressure and lift. Cuts into hard soils, frozen ground.
- ✓ Blade may be angled in 5 positions. Use as bulldozer or angledozer.
- ✓ Conveniently located frame tilting device tilts blade to left or right.
- ✓ Blade lifts to height of 18". Sufficient clearance for passing through ditches, over curbs, or down steep banks.
- ✓ Accessories include adjustable side plates and skid shoes to make soil peeling easy and prevent gouging. Blade extension, spring kit and skid shoes convert 6' blade to snow plow.

ARPS
CORPORATION

DEPT. R-10

NEW HOLSTEIN, WIS.

PRODUCTS FOR BETTER FARMS,
BETTER INDUSTRIES SINCE 1920

Portable digger digs 3 ft. post holes in 1 min.

A new portable lightweight post hole digger has been developed by Eugene John Freeman & Co. This new Super Hole-A-Minit, Model 63 S, is claimed to dig 6 in. holes 3 ft. deep in just one minute. For



Super Hole-A-Minit Digger

holes 6 ft. deep, there's the Super Hole-A-Minit Kit, Model 636 S. On this model (636 S) a shaft extension is practical for digging holes beyond the 6 ft. depth. Operating with any air drill equipped with standard Jacobs chuck or any 1/2-in. or larger electric drill rated at 600 rpm or less, 7 amps or more, the pulverizing action of the digger chews up softer shale and rides above large rocks without damage. The digger works in any remote location from a 1.5 kw portable ac or dc generator.

For additional information circle Number 53 on inquiry card.

New fork lift attachment for tractors

A new fork lift attachment for rear mounting on Ferguson and Ford tractors, now in production by Callahan Engineering Co., is claimed to be of particular value in rough terrain and soft ground. The attachment is quickly installed. Once installed it



Model FLR 3000 Fork Lift Attachment

can be removed in approximately one hour leaving the tractor in its original condition. This fork lift attachment has a rated capacity of 3,000 lb. at 24 in. load centers. Three models are offered with a 6 ft., an 8 ft. or a 10 ft. lift. Higher lifts can be had on special order. The 4 in. diameter hydraulic hoisting ram is run by a 11.5 gal. Vickers pump. The pump is driven off the crankshaft on the front end. There are two

ONE OPERATOR...



**can DIG...
HAUL...
DUMP...**

Saureman Scraper
cutting down a bank.

**DO THESE JOBS BETTER . . . CHEAPER . . . with a
SAUERMAN SCRAPER**

Dig an underpass, trench a stream, clean a culvert or tunnel, build dykes or cut down banks . . . One man—using a Saureman Scraper—can do them easily and economically.

The curved plates of the Crescent Scraper and bottomless construction combine maximum strength with minimum weight, thus reducing power costs.

See for yourself why Saureman Machines can give you maximum efficiency on many dig and haul jobs. Write for illustrated 24-page Catalog A. Saureman Bros., Inc., 588 S. Clinton St., Chicago 7, Ill.



SAUERMAN BROS., INC.

Earthmoving Equipment Since 1909

SAFE-T-CONE

ALL-RUBBER TRAFFIC GUIDES



Patent Pending

for EFFICIENT TRAFFIC CONTROL

During emergency street repair or the traffic rush hour . . . Safe-T-Cones are constantly on duty . . . guiding traffic safely thru congested areas. Used by traffic engineers from coast to coast, Safe-T-Cones are the answer to modern traffic problems. Available in two sizes, 18 inch and 28 inch, painted or reflectorized.

Write for complete information.

RADIATOR SPECIALTY CO.
CHARLOTTE, NORTH CAROLINA
IN CANADA: RADIATOR SPECIALTY CO., LTD., TORONTO



2011

3 in. tilt cylinders by means of which the mast can be tilted forward 17 degrees and backward 9 degrees. The control valves are the Vickers CM 2-04. If desired, a side shifter with an overall travel of 5 in. can be supplied for either factory or field installation. A load stabilizing clamp is also available.

For additional information circle Number 58 on inquiry card.

New all-weather top for tractors

A new Coverall tractor top, announced by Steelcraft Tractor Equipment Co., was designed to supply the demand for a fully



Tractor Cab for Winter Can be Converted for Summer Use

enclosed, all-weather tractor top which permits the use of any type of equipment attached to the front and/or the rear of any tractor. The Coverall, made of heavy waterproof material, is fitted over a sturdy,

folding steel frame, which is secured by brackets bolted to the fenders. Excellent visibility is afforded by the large windows in front, side and rear curtains. These windows are made of a new type vinylite plastic exceptionally tough yet very flexible and pliant, insuring long life under severe conditions.

For additional information circle Number 70 on inquiry card.

Concrete cutter has high power and light weight

A new low cost Di-Met concrete cutter, known as model 135, has been announced by Felker Manufacturing Co. This model, of 3-wheel design, is specifically designed to provide high power with light weight. It utilizes a 13.5 hp gasoline engine driving a standard 12 in. diameter diamond blade which cuts to 3½ in. deep. The diamond wheel is protected with a guard, the front half of which is hinged to raise out of the way. This permits instant cutting close to



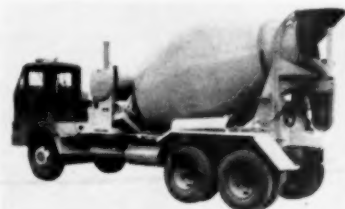
Model 135 Concrete Cutter

curbs, walls, etc. The model 135 has been especially designed for cutting contraction joints, curbs, driveways, walks; for trenching, patching, installation of utility poles, street signals, etc.

For additional information circle Number 76 on inquiry card.

Six different size truck mixers available

Cook Bros. Equipment Co., exclusive national distributors for the Challenge line of truck mixers, has announced that these mixers are now available in six different sizes, affording a wide range of drum vol-



6½ Cu. Yd. Truck Mixer

ume capacities. The mixers can now be purchased in 3, 3½, 4, 5, 6, and 6½ cu. yd. sizes, thus making possible the proper selection of mixer and truck in terms of maximum efficiency for the specific operation at hand. While all Challenge truck mixers conform to TMMB drum volume standards, the adoption by Challenge of a wider range of sizes is claimed to allow maximum utilization of the load carrying capacity of the truck for hauling payload, in full compliance with highway weight limit laws.

For additional information circle Number 54 on inquiry card.

(Continued on page 142)



Dragline, Clamshell, Custom-Built Buckets Stone and Wood Grabs

WELLMAN Williams Type

MORE YARDAGE PER DAY

● Elimination of excess materials and careful weight distribution permit rapid, rhythmic operation of Wellman Dragline Buckets. Operators can cover a wider digging radius with this streamlined bucket.

Built of special alloy steel, using strong welded design, Wellman buckets provide strength and stamina for long-term economy. Perforated designs also available. You'll do better with Wellman.

Want Facts? Write for free descriptive bulletins

THE WELLMAN ENGINEERING COMPANY
7000 Central Avenue
Cleveland 4, Ohio

Bituminous

ROADS AND STREETS



Cover Story

Heavy-duty asphaltic concrete on rolled stone base was used to pave this 1,800-ft. detour along Michigan Boulevard, downtown Chicago. The pavement will carry 45,000 vehicles daily for 9 months during construction of an underground parking garage.

Published by McGraw-Hill Publishing Company
1221 Avenue of the Americas, New York 10, N.Y.

Protective Sealing with Coal Tar Pitch Emulsion
How Winter Stockpiling Helped Get Early Start
Heavy-Duty Detour on Chicago's Lakeshore
One Way to Squirt a Side Road Turnout
Experience with Emulsion by City of Dearborn
New Developments in Equipment and Materials

MAY, 1953

Some new thinking on DENSITY in ASPHALT ROAD CONSTRUCTION

IN VIEW of the fact that density under a screed or tamper varies with the thickness of material above the high or low spots in the subgrade, and in the presence of large stones in the mix, any approach to securing absolute uniformity in the thickness of a road from subgrade to surface would be an approach to uniformity in density. Obviously uniform thickness is the result of accuracy in grading and accuracy in spreading.

Here, for the first time, is a real approach to the ideal conditions required for absolutely uniform density and uniform thickness with a truly level course the full width and length of any road, from subgrade to surface.

The Adnun with the Fluid Level is not just a Black Top Paver! Not just a Material Spreader! With the Fluid Level the Adnun is a complete Road Builder! The Fluid Level makes it possible to begin with your properly graded subgrade and lay the base course of any material to an absolute plane the full width and length of the road. Successive courses of asphalt will be equally uniform.

With uniformity of thickness in each successive course from subgrade to surface you have an approach to uniformity in density never before possible.

The Fluid Level takes out the dips that won't show under a straight edge. It brings long wheelbase results to an already compact, easily portable unit. It makes possible greater surface smoothness that results in better drainage and reduced breakdown. The possibility of holding error to within one or two per cent, means less waste of material and cuts costs to the taxpayer and the loss for the contractor. Investigate this method of building roads. It brings you a long sought answer to better built, lower cost roads that will go far toward meeting today's traffic problems.

Ask for the booklet, "Put A Level On Your Roads", for more details.

ADNUN
TRADE MARK REGISTERED
BLACK TOP PAVER



This little booklet entitled, "Put A Level On Your Roads", tells you all about the Fluid Level. If you haven't seen it, send for it.

**FOOTE CONSTRUCTION
EQUIPMENT DIVISION
OF BLAW-KNOX CO.
1936 State Street,
Nunda, New York**



BLAW-KNOX

B I T U M U L S I S V E R S A T I L E

**New life for
old pavements...**



**Long life for
new pavements...**



... with versatile BITUMULS® surface treatments

NAME THE PROPERTIES you want in a paved surface and you name the qualities of Bitumuls Surface Treatments:

**Waterproof Seal • Non-Skid Durability • No Bleeding
Uniform Texture • Ease of Application
Maximum Aggregate Retention**

In addition, there is a Bitumuls Surface Treatment (whether Single, Double, or Triple) to meet every type of surfacing problem. Worn, cracked or uneven pavements can be smoothed and sealed; and unsightly patched areas can be made uniformly attractive. On new construction, the life of the pavement can be greatly extended by a Bitumuls Seal.

Bitumuls Surface Treatments are easy and economical to apply. For detailed description of each type send for the

new illustrated Bulletins: "Surface Treatments and Penetration Pavements" and "Bitumuls for Maintenance."

Bitumuls for all your paving needs

Quick-Setting Grades of High Viscosity Bitumuls are designed for Surface Treatments and Medium Viscosity for Full Penetration Pavements; Mixing Grades for use with fine or coarse aggregates. All grades are available for prompt on-job delivery from plants conveniently located.



Bitumuls Engineers will welcome an opportunity to meet with you to discuss your paving needs.

**AMERICAN
Bitumuls & Asphalt
COMPANY**

200 BUSH STREET • SAN FRANCISCO 4, CALIFORNIA

E. Providence 14, R. I. Perth Amboy, N. J. Baltimore 3, Md. Mobile, Ala.
Columbus 15, Ohio Tucson, Ariz. Seattle, Wash. Baton Rouge 2, La. St. Louis 17, Mo.
Inglewood, Calif. Oakland 1, Calif. Portland 7, Ore. Washington 6, D. C. San Juan 23, P. R.

the only thing that
PAYS-OFF
in a bituminous
plant is...

B-G

TONNAGE
Produced!

**EVERY FEATURE OF THE BARBER-GREENE 848 PLANT
WAS DESIGNED TO INCREASE TONNAGE PRODUCTION**

There is nothing to equal the constant, low-cost, top-capacity production of the 848 plant that provides 80 to 140 tons per hour of the finest bituminous mix.

Its portability means less moving time. Its separate components mean less set-up time. Its automatic, interlocked operation assures accuracy and means less loss due to the human element.

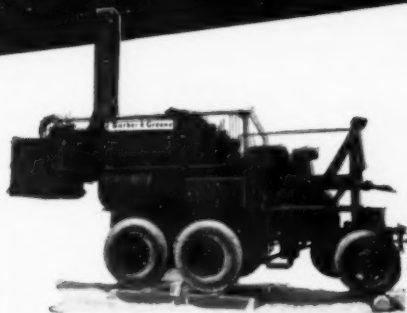
Its simplicity of operation and quality construction mean less down time. Its unique simple sampling means less interrupted time.

Its adaptability to all types of mix, including stabilized mixes, means more profitable production.

See your B-G Distributor for complete information on the high capacity 848 Bituminous Plant.

see your **B-G** distributor ...or write

THESE BARBER GREENE UNITS GIVE YOU
the capacity you want!
the mixes you require!



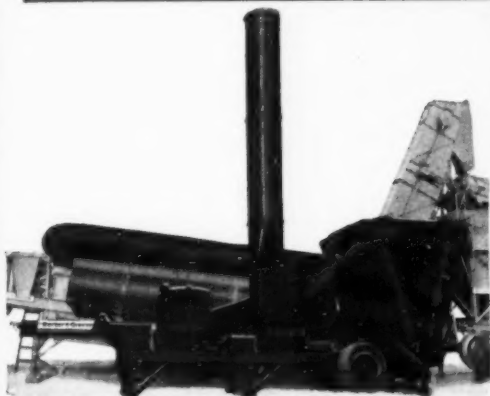
848 MIXER

Paces the industry. Produces highest type mixes. Capacities to 140 t.p.h. on bituminous mixes . . . over 300 t.p.h. on stabilization jobs. Easily portable from job to job.



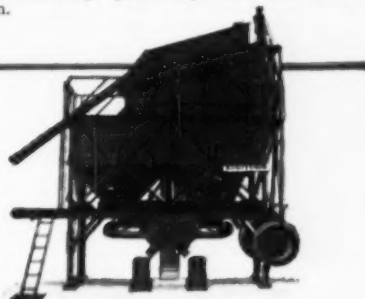
837 DRYER

Plant production depends on dryer capacity. The Barber-Greene Dryer has set new standards in capacity, efficiency, portability, and low cost operation.



857 DUST COLLECTOR

Fines reclamation is essential to high-type mixes. Banks of small-diameter cyclones assure efficient operation, compactness, easy transportability, reduce dust nuisance. Stationary or portable types.



866 GRADATION CONTROL UNIT

The gradation control unit that made the production of high-type mixes automatic, because it provides an improved method of control—up to 4-bin separation.

PLUS A COMPLETE LINE OF B-G ACCESSORIES including cold elevators — hot elevators — fines feeders. 2, 3 or 4-bin portable feeders — portable conveyors. Bucket loaders for travel plant service.

Barber-Greene

Aurora, Illinois, U. S. A.



CHECK THESE IMPORTANT ADVANTAGES OF McConnaughay Asphalt Emulsions FOR ROAD-MIX PAVING JOBS

McCONNAUGHAY LICENSEES Operating K. E. McConnaughay Emulsified Asphalt Plants

Berkshire Asphalt Co., Inc.
Springfield, Massachusetts
James Huggins & Sons, Inc.
Malden, Massachusetts
Bituminous Materials Co.
Jackson, Michigan
Midwest PreCote Co.
Kansas City, Missouri
Albany Asphalt & Aggregates-Co.
Albany, New York
Knight Paving Products, Inc.
Gardenville, New York
Knight Paving Products, Inc.
Ithaca, New York
Knight Paving Products, Inc.
Rochester, New York
C. C. Plumb, Elmwood Station
Providence 7, Rhode Island
Seaco, Incorporated
Columbia, South Carolina
C. C. Plumb
Hartford, Connecticut
Asphalt Products Co., Inc.
Nashville, Tennessee
E. A. Mariani—Emulsified Asphalt
Tampa, Florida
Emulsions, Inc.
Lawrenceville, Illinois
Walsh & Ikeler
Gary, Indiana
Ready-Mix Asphalt, Inc.
Fort Wayne, Indiana
Faubert Construction Co.
Lafayette, Indiana
Brookman Construction Co.
Muncie, Indiana
Bituminous Materials Co.
Terre Haute, Indiana
Wabash Valley Asphalt Co.
Terre Haute, Indiana
Asphalt Materials and Construction, Inc.
Indianapolis, Indiana
Pan-Am Southern Corporation
New Orleans, Louisiana
(Also serving Alabama and Mississippi)
Doherty and Swearingen Co.
Yarmouth, Maine

Eastern Representative:

John A. Dow
801 Second Avenue
New York 17, N. Y.

Export Representative:

William H. Schuelie
545 Fifth Avenue
New York 17, N. Y.
and
214, The General Scott
No. 1 Scott-Circle, N. W.
Washington 6, D. C.



Above—Open-Graded Road Mix, Specification No. 3... Indiana-State Highway; inset—
Sand-Mix, Specification No. 8... Guatemala, C.A.

Highly Water-Resistant in ALL Stages

Water and weather are of less concern on road-mix jobs when you use McConnaughay Emulsified Asphalts. Here's why:

These superior emulsions *may be mixed with either wet or dry aggregates*, but give even better results when no water is added. They are little affected by water or rain during construction or after the paving is completed... not susceptible to drainage after mixing... have excellent adhesive

qualities... assure quick compactibility after application. These features mean quicker, easier, better paving.

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K. E. McCONNAUGHAY
EMULSIFIED ASPHALT
Plants and Processes

LAFAYETTE 4, INDIANA

VIEWS AND COMMENTS

By H. G. Nevitt

Something Might Well Be Added

The continued development of the through traffic toll road into a more widespread part of the highway system brings interesting new engineering aspects.

We do not propose to discuss the pros and cons of such roads in the proper development of our transportation system. Much can be said on both sides. It is our view that the public in due course will demand that through highways be made part of the free highway system, to be paid for as part of the general program. In making such demand, the public will accept the necessity for increased user taxes and probable changes in methods of financing. The public may also become more exacting in its demands that highway administrators get the most for the money.

At present, the adoption of the toll road idea seems in prospect in a good many states. In bringing immediate traffic relief, this may be a blessing. But other benefits should stem from this trend. One benefit is in the economic lessons. Since the toll road must be paid for more directly by the users, the planning of a toll turnpike demands stark realism in economics. Specious arguments from land use beneficiaries, and even politics to some degree, tend to be eliminated. If not, the bonds won't sell. There is a healthful influence in the science of traffic analysis, and in the realism used in locating these main routes.

Critical Design Approach

Competition for the job of engineering toll roads should likewise foster a more critical attitude in their design, including structures, subgrade, base and pavement. Bankers and private investors are hard buyers. In time, the consulting engineers who get the job done for the least money, considering both first cost and maintenance, will be given the toll road business. Realizing this, consulting engineers will be both objective and critical in evaluating the ideas and methods presently favored by road builders.

It seems to us that there could well be more of this ingredient of economic answerability in all parts of our highway picture. Every thinking man must realize that this nation's

industrial leadership lies in the existence (until recently?) of a true, free enterprise system. Nothing so stimulates men in production, or in critical evaluation, as competition. Competition rewards those who make real contributions to the benefit of society. We have seen some signs of this competition between various governmental road building agencies, but it is based more on pride and a desire for individualism than on the more unrelenting need for economic survival. If the consulting engineer through his toll road work succeeds in bringing a demand for results, comparable to the demand found in our industrial technology, we can expect a faster progress in the difficult field of highway engineering.

Objective Thinking Lacking?

The reader may comment that there is little evidence of such a benefit to date; we are not in a position to deny or agree. But it is time for consultants to pause and consider their proper function here. They should not deserve employment for routine layouts or the solution of special local problems alone. And the basic design adopted for a turnpike—every mile of which greatly affects ultimate cost, traffic safety and efficiency—cannot simply follow arbitrarily selected practices in procedures and materials.

No implication is made that such arbitrary thinking has not been followed in turnpike designs to date; we are sure that these designs have been adopted after much discussion. But we suspect, on the basis of the known records, that an objective engineering background would be difficult to establish for some of the decisions made. This is of course not a novel situation with construction projects, public or private. But when a project has to withstand the searching scrutiny that follows the building of other projects performing well at low cost, there is a tendency to strive for decisions that need no defense on the basis of being unusual in design for the area.

Still another question might well be raised with respect to toll roads and all roads. Should the business interests involved, who do have the commercial motive, perform the func-

tion of criticism? We use the term in the stricter meaning of inquiring observation and judgment. We believe these interests should criticize, although consulting engineers are usually in a position to do a better job, and industry can at best only aid. We question whether commercial suppliers are being critics to the point that is justified. The view seems prevalent that ill feeling and prejudice would result. Hence we rarely hear of challenges to present ideas from commercial interests (in contrast with the vigorous criticism from contractors). The few challenges that do occur come from the theoretical technicians of industrial suppliers, rather than from those in contact with jobs and able to speak with more authority on practical road problems.

It is our personal view that this lack of criticism is a mistake. True, highway administrators, being human, do not enjoy disagreement. But with few exceptions they will take, and eventually appreciate, honest and constructive discussion of their ideas. We believe the average highway engineer rates well from this standpoint. His chief fault is rather that he wants to get a simple, easy and practical answer to problems where such an answer is not always possible. He may take pleasant but unsound substitutes for the hard realities—a universal human trait.

Should Speak Out

Admittedly it takes time to get action from helpful ideas, public work being what it is. But unspoken disagreement certainly is not a friendly action. It helps no one in the end, and is not to any group's ultimate interest.

This is not a brief to justify the non-constructive (and usually uninformed) criticism which highway engineers often get from the public. Such criticisms may come from the press, from people with a selfish interest, or from those who make random observations while driving at high speed. But that business which looks to highway construction for part of its living, employs men presumably qualified to speak out authoritatively. These representatives should so speak when they believe they have something to contribute.

Protective Seal Coating

With Coal Tar Pitch Emulsion

By Charles M. Upham

Consulting Engineer
Washington, D. C.

WITH the great increase of aircraft operation during recent years, a problem that has beset flexible paving design engineers in the past has become intensified; that is, the deterioration of the pavement surface caused by solvent action of spilled fuels. Critical airfield areas are usually maintenance aprons, taxiways, fueling areas, and runway ends.

Great strides have been made during recent years in the design and control of dense-graded hot-mix asphalt pavements. Where such pavements are not subjected in their early life to high incidence of fuel spillage, it is possible for them to create a surface through slight hardening and oxidation of the upper 1/16-in. depth, which has certain resistance to solvent fuels. This is noticeable on high type dense graded airfield pavements, which are over one year old. Unfortunately, however, the using service cannot wait for the facility to undergo a curing period of that order.

An eminent asphalt paving technologist covering this subject for the Military recently stated:

"For new paving, however, in order to be doubly sure of resistance, a protective coating may be applied to take care of the first months of operation. There are a

number of resins which can be applied in very thin films which are completely unaffected by petroleum distillates. However, the lowest cost treatment is probably a tar pitch emulsion. . . . Ordinary tar seals are of no advantage for this purpose. . . ."

Investigation Made

Many paving engineers who should be gravely concerned with finding an economical effective answer to this fuel damage problem have not used this simple solution. Possibly this is because they are unacquainted with actual performance of such seal coats in the field. For this reason, it was determined to make a first-hand, unbiased inspection of representative coal tar pitch emulsion seal coats and check their performance under actual exposures. It was decided to consult first with responsible manufacturers of coal tar pitch emulsion sealing materials to get detailed information about such products and diversified application histories.

From subsequent inquiries, it appeared that Maintenance, Inc., of Wooster, Ohio, marketing a product known as Jennite J-16, was a company producing a coal tar pitch emulsion which had a field history of more than ten years, and for this reason, it was concluded that for the study, investigation might advantageously be limited to applications of material produced by that concern, and from

reports covering these applications.

In view of the above, a conference was arranged with officials of Maintenance, Inc., to obtain sufficient technical data to make an evaluation of coal tar pitch emulsion seal coat applications, which have been subjected to typical exposures in various parts of the country over a period of years. Technically this product is an emulsion of pure coal tar pitch dispersed in water by means of finely divided irreversible mineral colloids. It is resistant to motor oils, gasoline, jet fuels, distilled water, salt fog, the sun, and most acids, salts and bases used in industry; moreover, it is easily applied without heating or special equipment.

An inspection report was first made of several typical installations in Ohio. Of particular interest was the North American Aviation Co. (U. S. Navy Facility) Columbus, Ohio where since 1945, approximately 1,000,000 square yards of bituminous pavement have been sealed with Jennite J-16. Because of fuel and oil spillage as well as the type of aircraft maintenance performed in these areas, it would be expected that extensive pavement damage would have been incurred. But even in the open type mixes, which were inspected, no disintegration due to solvent action of petroleum distillates was found.

Other Durability Examples

Another revealing observation was the fifty-plus bituminous surfaced tennis courts of Ohio State University sealed with coal tar pitch emulsion



★ Passenger loading area at Indianapolis municipal airport



★ Applying emulsion by squeegee on small areas



★ Application of coal tar pitch emulsion to aircraft parking and service areas, North American Aviation plant, Columbus, Ohio. Burlap drag on back of pickup truck used to insure uniform seal

during 1947 and 1948. Ordinarily one would expect these areas to show signs of checking because of lack of lifegiving traffic, actinic rays, or to radical temperature departures affecting an unused pavement area over long periods of time; but quite the contrary was true. Reports of the paving mix showed that the asphaltic concrete was as flexible and alive as it would have been if it had been subjected to continuous rolling traffic.

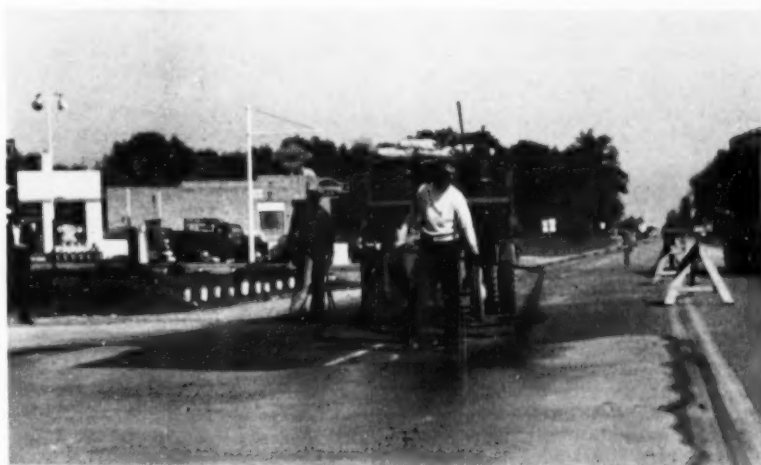
It was further reported that the Standard Oil Company (Ohio) had been using this material since 1941 to protect their blacktop service station pavement and officials of that company stated that through the use of this method of pavement protection, maintenance due to gasoline and oil spillage around their pump islands and driveways was at a minimum. Three other major oil companies reported similar experience.

It was determined that among other municipalities, the City of Detroit had used tar pitch emulsions for the past eight years for pavement sealing. Mr. C. L. Shattuck, Engineer of Asphalt Construction there states:

"We have used Jennite J-16 in conjunction with our asphalt paving for the past eight years. The coating has been used for waterproofing gutters, for protection of bus-stop areas, on airport fuel loading stations and other sections which are subjected to oil and gasoline drippings. The results have been very satisfactory and the maintenance required on these areas has been reduced considerably."

At Will Rogers Field, Oklahoma City, the loading area which was sealed with J-16 in 1948, has been continuously subjected to fuel and oil spillage and locked wheel turns of commercial airline traffic as well as extensive sun exposure, but inspection showed that the sealed pave-

(Continued on page 134)



★ Intersection of U. S. 24 and U. S. 25 outside Detroit, Mich. 15,000 sq. ft. of asphaltic concrete sealed with Jennite J-16 in September, 1949, for state highway department. Silica sand embedded for better skid resistance



★ Loading area at Will Rogers Field, Oklahoma City, showing comparison of condition of section sealed with coal tar pitch emulsion in 1948 (background) and adjacent unprotected pavement (foreground) after four years of service

Winter Stockpiling, Aggregate Blending

SPEEDED MINNESOTA HOT MIX JOB

Contractor hauled and stockpiled 65,000 cu. yd. of gravel in winter for 18.7-mile resurfacing project, to avoid road damage and permit earlier spring start. Blending of coarse material proved more economical than wastage of fines in correcting gradation.

A BITUMINOUS resurfacing project was completed in Minnesota last season in which a significant new policy of the Minnesota Department of Highways was demonstrated. It is the innovation of requiring winter stockpiling of aggregates prior to the spring thaw, in order to prevent road damage and expedite hauling.

The project in question was an 18.7-mile job extending through Breckenridge, Minn. on U. S. 75 and east of this city on State Route 3. The job involved a two-course bituminous resurface, the old 20-foot concrete on the rural section being also widened 18 inches on both sides with bituminous base mixture and the shoulders given a granular lift.

Since the job entailed hauling 65,000 cu. yd. of gravel an average distance of thirteen miles, the state engineers decided that here would be a good place to require advance winter hauling of materials, for the reasons noted above. In December of 1951 a gravel hauling contract was awarded on low bid to Megarry Bros., contractors, of St. Cloud, Minn. This outfit promptly moved in and hauled the entire yardage over frozen roads, taking only fifteen 22-hour days to stockpile the material at a suitable plant site on the project. Two draglines loaded the trucks and a ripper was on hand for breaking up frozen ground if necessary. Stones over 8 inches were scalped at the pit.

Excess Fines

The surfacing contract, awarded also to Megarry Bros. on low bid in the spring of 1952, included the major items of 9,500 tons of bituminous-widening base mix, 17,700 tons of leveling course mix, 4,100 tons of surface course mix with mineral filler (for surfacing in Breckenridge), and 23,600 tons of surface course mix without mineral filler for the rural section.

The contractor set up his aggregate crushing plant at the previously placed stockpiles, with the expectation that a high percentage of excess fines

would have to be dispensed with to meet gradation requirements. A start was made which indicated that approximately 15 to 20 per cent wastage would be necessary.

At this point the state engineers re-analyzed the gradation problem, with the result that it was found possible to make the necessary correction of gradation for the asphaltic mix more economically by adding 10 to 12 per cent of coarse granular material available. With the engineer's permission, after necessary tests, the contractor was given permission to make the correction in this manner, and did so for the remainder of the job with excellent results. The coarse material used consisted of screenings from old piles located within 30 to 40 miles of the job. The procedure was to haul in the material and dump it along the back side of the stockpile. The material was then dozed up and over the stockpile and into the feeder trap in such a manner as to blend coarse material with fine.

This was admittedly a tricky procedure from a gradation control standpoint; the Minnesota state engineers ordinarily require material for blending to be fed by a separate conveyor

belt. However, it was agreed to try blending with the dozer, and as a result of full cooperation between inspectors and the contractor's men, excellent gradation was secured through the crushing and screening plant.

Widening and Resurfacing

Widening trenches on the rural section were cut with a motor grader and bituminous mix was spread and compacted in two 2¼-inch layers. An Apsco widener and a Gallion and an Apsco trench roller were used, with six roller passes specified for each lift.

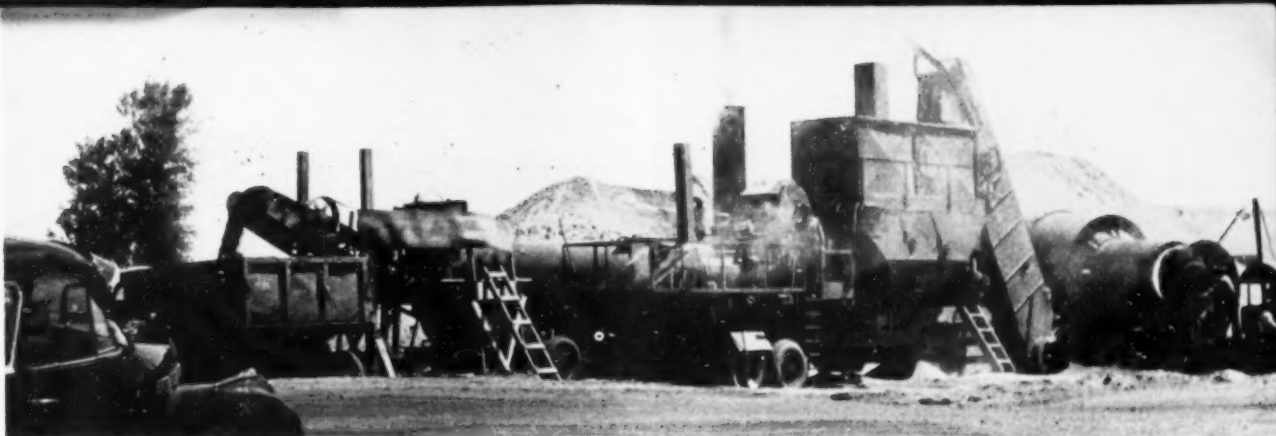
The old pavement, following necessary spot repairs and reconditioning of joints, was given a tack coat consisting of 0.035 to 0.040 gal. per sq. yd. of RC2 asphalt applied at 175 degrees F.

The leveling course mix was then spotted by trucks, spread half-width at a time with blades, and rolled with pneumatic rollers and a 12-ton 3-wheel steel roller. About 150 lb. average per sq. yd. was applied for leveling with ½-in. minimum at the edges of the old pavement.

The surface course mix was then spread mechanically, applying about 200 lb. per sq. yd. to complete the job. A one-aggregate mix was used for widening and leveling. For surfacing, a two-aggregate mix was used with 3 per cent of mineral filler added to the mix for the pavement through Breckenridge, on recommendation of the state highway Materials and Re-

★ Stockpiles built up in winter were corrected for excess fines by dumping coarse material at the rear and blending by skillful dozer passes toward the trap





★ The asphalt plant, a Pioneer No. 101 Continuflo assembly, produced 160 tons of hot mix per hour at peak going

search laboratory. A denser mix was considered desirable for urban sections due to greater concentration of surface water and increased oil drippings from parked vehicles.

The surface mixes using 100-120 penetration asphalt were designed in accordance with the gradations tabulated.

Mixture Gradations

In Breckenridge		Rural
Pass $\frac{3}{4}$ "	100	100
$\frac{1}{2}$ "	95-100	95-100
$\frac{3}{8}$ "	65-90	65-90
#4	50-70	50-70
#10	35-55	35-55
#40	15-30	10-30
#200	4-8	1-7

Megarry's asphalt plant—one of six in use by this contractor—consisted of a Pioneer No. 101 Continuflo plant assembly and supporting equipment as described in the accompanying pictures and captions. This plant handled 160 tons per hour at peak of production.

Robert Koehn was Megarry Bros.' superintendent, A. M. Ungerecht was project engineer and H. L. Anderson inspector for the Minnesota State Department of Highways.

Notes on Mix Design

It will be instructive in connection with this job review to note comments made on similar projects, and asphaltic hot mix projects in general, as



★ A 7,000-gal. fuel oil tank—one of several trailer-mounted units assembled by Megarry Bros.

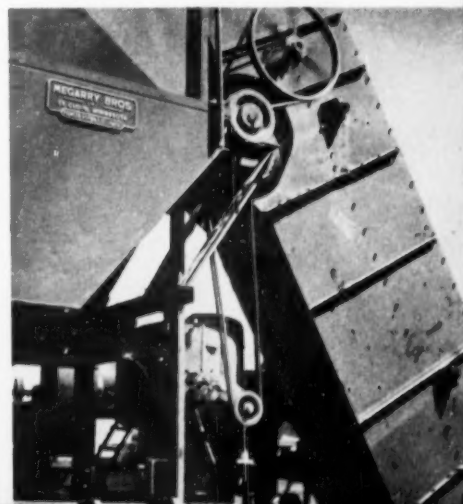
completed in 1952 in the Minnesota state road program. These jobs involved some 1,250,000 tons of hot mix on 735 miles of work. A report made by the Division of Materials and Research of the Minnesota Department of Highways under John H. Swanberg, notes that hot plant mixtures as finally placed represented "consider-

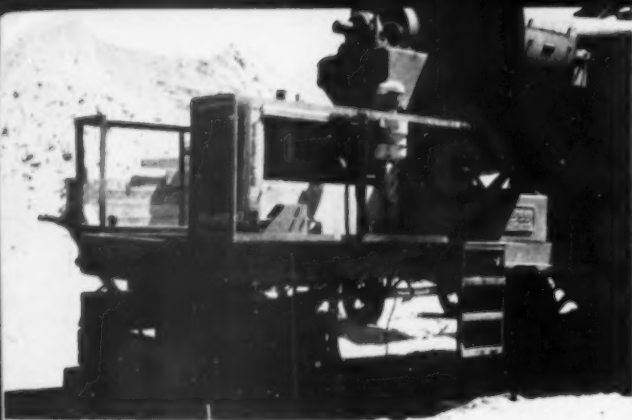
able laboratory work and field reconnaissance relative to obtaining a suitable aggregate which will meet required standards of quality and gradation for the projects. In several cases considerable laboratory investigation was necessary before a suitable aggregate was found that would meet standards set up by the laboratory."

★ Megarry Bros. aggregate plant, a Cedarapids Junior Tandem with Caterpillar D8800 drive, is pictured here rejecting fines (left) in a stockpiling operation for sealing chips needed on nearby work



★ The hot elevator was powered by an International gasoline engine with V-belt drive

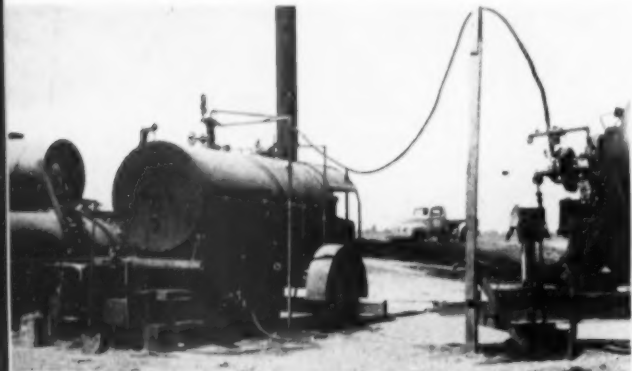




★ The dust collector was powered by a D315 Caterpillar engine mounted on the unit's trailer bed



★ D318 Caterpillar power unit, connected by belt and gear to the dryer, and by shaft and gear extension to the cold belt



★ The steam generator for asphalt heating was a Cleaver-Brooks unit. Asphalt pump operated by a 60-hp. Waukesha gasoline motor, not shown. (Right): Asphalt storage tank trailer with extra capacity added on rear



This statement is a reminder that good aggregates are getting scarce in Minnesota, as in many other areas, and that the state is going a long way to develop means of utilizing materials at hand.

In commenting on another project, this report said: "The closest available aggregate sources provided material rather fine in nature, but a gravel source much coarser was available at a greater hauling distance. A mixture of gravel from the two deposits met the standards required, and both pits were shown as designated deposits and percentages of each gravel determined."

On another project north of the Twin Cities area, the gravel deposit most economically situated was rather fine in nature and the gravel in the

area contained a high percentage of sandstone. The addition of 20 per cent of crushed aggregate from $\frac{3}{4}$ in. to No. 4 was specified to bring the aggregate up to requirements.

In the past, on some projects where the deposit is fine in gradation the special provisions have required wastage of sand. "Based on experiences of the past few years," notes this report, "it may be advisable in some instances to call for the addition of coarse gravel or crushed rock to the fine gravel to meet gradation requirements instead of rejecting fines."

Mineral Fillers

"In addition to mixing gravel from different deposits, or the addition of crushed rock to mixtures to improve their quality and gradation, mineral

fillers are being used on some projects to increase the density, stability and durability of the mixtures on heavier travelled highways. The mineral filler consisted primarily of limestone dust with a small quantity of portland cement also being used." Approximately 6,200 tons of mineral filler were used in 1952. The urban section through Breckenridge here described is an example.

• **Herb Eldridge**, recently Chief Engineer of Planning for the Texas Highway Department, has been named Director of the Arkansas Highway Department. He was for 33 years with the Texas organization, and goes to Arkansas as part of a newly established expanded form of State Highway organization.

★ The contractor set up a trailer-mounted gasoline dispensing station at the plant for his truck drivers. (Right): Spreading leveling mix through the town of Breckenridge



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★ Excavation in the midst of traffic, prior to completion of the detour, required close control of truck arrivals and fast loading to minimize traffic disturbance. Bucyrus-Erie shovel

★ How the detour looked immediately after opening. Stone base being constructed; excavation for the underground garage in progress. Over a million dollars worth of equipment on the job here. (United Press Photo)



★ (Left): Boring post holes for guard fence to flank the crushed stone shoulders using Buda unit. (Center): Laying duct for electric lighting along the detour. (Right): Rolling last lane of binder course. Galion roller

★ Rock Road Construction Co. placed the two asphaltic courses with a single Barber-Greene finisher and two rollers. This roller a Buffalo-Springfield. International dump truck shown

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"Shoo-Fly" for Michigan Boulevard

Heavy-duty detour pavement on Chicago's lake-front artery will carry 45,000 vehicles daily for 9 months while underground parking garage is completed.

IN Chicago where Michigan Avenue is something of an institution, motorists woke up one morning to find that a kink had been put in this busy street. On Monday, March 16, traffic was shunted to an 1,800-foot, 4-block-long "shoo fly," designed to serve during the first stage of construction of a 2,350-car underground parking garage.

In planning the project the Chicago Park District engineers, under Chief Engineer Robert A. Black, realizing the high public cost of traffic disturbance, set a tight schedule for the contractors. The contract requires completion in 675 working days from January 15, with a stiff penalty for delay and bonus for early completion. John Griffiths & Son, general contractors, were awarded the \$3,945,000 dollar contract for the garage project for which Ralph H. Burke, Inc., Consulting Engineers, are serving as de-

signers and supervisors of construction.

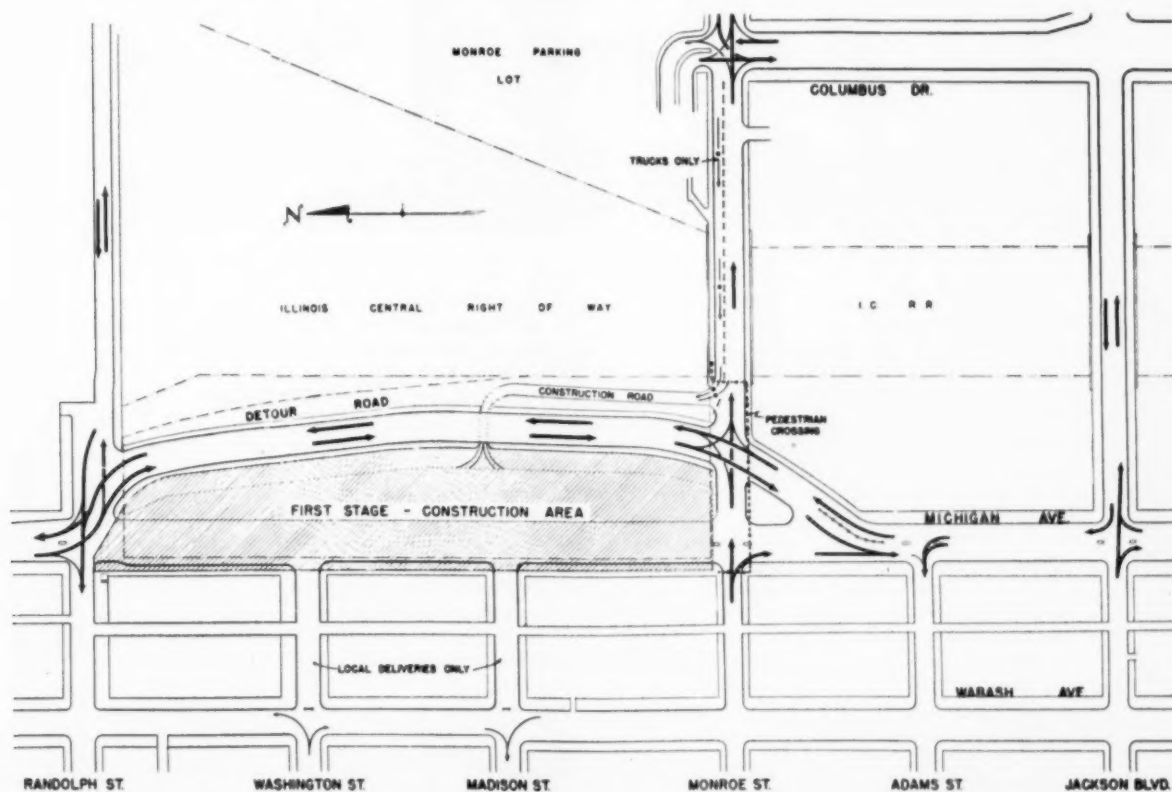
The new underground structure will occupy the space between the curb line along the west or business side of Michigan Avenue, and the Illinois Central depressed tracks toward the lake front. The scheme is to close off Michigan and build half of the structure, including the necessary entrance and exit ramps then shunt traffic back to normal using the garage roof as the final roadway, and then complete the other part of the structure.

The heavy-duty roadway required is unique in detour annals, in that it will carry 40,000 to 50,000 vehicles daily on 6 lanes for a period of nine months. Matching somewhat the existing cross-section of the boulevard, the detour roadway is 60 ft. wide. There are crushed stone shoulders on either side. The pavement consists of two

1½-inch courses of asphaltic concrete supported on a 9-inch crushed stone base and 12-inch pit-run gravel subbase, the base and subgrade compacted to 100 per cent modified Proctor density.

A particularly tight schedule was established for getting this detour built. The contractor put in most of February on preliminary work, and about March 1, began building the roadway. Standard methods were used to place and compact the subgrade, subbase and base. Rock Road Construction Co., Chicago paving contractors then moved in, as subcontractors, supplying and placing the asphaltic concrete. Despite rainy weather, traffic was put on the completed detour over the week end of March 15, and the boulevard closed off. The contract places a 325-day time limit on the close-off, with a separate \$500 a day penalty, and bonus; December 15, 1953, is set tentatively for the reopening.

During the first two weeks of March the contractors not only built the roadway, but also provided temporary wood fence, traffic lights, channelizing, guard fence, and relocated light-



★ Traffic detour scheme for downtown streets in vicinity of Michigan Avenue detour, designed to expedite traffic

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★ At the north end, where the detour cuts into Randolph Street, a wedge course of hot-mix was placed to tie in with the existing pavement, using a Caterpillar No. 12 grader and rollers; traffic blocked off by traffic cones



★ Speedway Wrecking Company's equipment included an Allis-Chalmers HD-9G tractor-loader



★ Steel sheeting was driven to form the abutments and wing walls of this temporary construction underpass beneath the detour road

ing facilities. A temporary underpass span built of steel beams with timber planking was provided for access during the excavation and structural work.

In taking bids the Park District considered alternate proposals covering various methods of disposing of the 350,000 cubic yards of excavation involved. The alternates included disposal at various sites in Grant Park adjacent to the work, and also hauling over prescribed street routes to help make fill between 31st and 47th on the South Shore Drive relocation now under construction, and/or the Lake Shore Drive extension at Foster Avenue, on the north side. The deci-

sion was to haul partly to nearby Grant Park and largely to Foster Avenue, where fill is needed for expediting that urgent project. Speedway Wrecking Company of Chicago, is doing the excavation and disposal.

Traffic flow problems had been carefully studied in advance, and a scheme worked out in accordance with the accompanying map with all Chicago agencies cooperating. Traffic jams on the first day of the detour, due to public unfamiliarity, were quickly relieved and the detour has been operating smoothly and satisfactorily.

Indiana has new speed law, new sign program

The Indiana State Highway Commission, cooperating with the State Police, have in production 1,000 new 65-mile-an-hour speed limit signs to be placed at all Indiana Highway points leading from adjacent states into Indiana and at other strategic locations. Indiana has a new speed law setting 65 mph. maximum for cars, 55 mph. for buses and 45 for trucks. As part of a campaign against accidents from out-of-state vehicles, the recent sign program has also included over 1,500 truck and bus speed signs at 5-mile intervals on all main highways and those heavily travelled routes more commonly used by trucks and buses.

5 bids per job

A Bureau of Public Roads survey shows that the average number of bidders on all federal-aid road construction jobs was 5.0 bids for 1952, somewhat higher than the previous year. The number per project increased appreciably in the last part of 1952.

Comparative figures for the last several years are as follows:

1946.....	3.9
1947.....	3.8
1948.....	4.2
1949.....	6.3
1950.....	6.0
1951.....	4.5
1952.....	5.0

★ Small hand roller used to help iron joints in the asphaltic concrete



● Joseph J. Darcy, well-known District Engineer in charge of the Long Island District of the New York State Department of Public Works, has retired from State work after 43 years of service. His early service included engineering work on the New York City subways and State highway construction projects. In announcing Mr. Darcy's retirement Superintendent B. D. Tallamy pointed out that almost all of the present system of modern highways, parkways, and expressways on Long Island and in the metropolitan area has been built since Mr. Darcy became District Engineer of this densely populated area of the State.



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PUMPING BOOSTER — Heats by direct firing 4 times as fast as steam, recirculates, then delivers bituminous materials directly to distributor. Heats only the amount of material required — not necessary to heat entire car. No steam or water required for operation. Has self-contained fuel and gasoline tanks. Available in two sizes, trailer and skid mounted: No. 1A Booster heats approx. 300 GPM temp. rise 25°-35°F; No. 2 Booster heats approx. 350 GPM temp. rise 45°-55°F. Ask for Bulletin RM-107.



"DEUCE", COMBINATION TANK CAR HEATER AND PUMPING BOOSTER — It's a portable steam boiler and direct-fired heater mounted on a single frame. Look at this three-job versatility! "Deuce" steam preheats one car to pumpable consistency while circulating and heating a second car to application temperatures. Same unit also pumps and loads distributor or transfer truck. Ask for Bulletin AD-104.

Cleaver-Brooks



Pioneers and Originators of Self-Contained Boilers, Tank-Car Heaters, Pumping Boosters, The "Deuce" and "Peak-Temp"

One Way to Squirt a Side Road Turnout

The distributor pictured was working as part of the outfit of Inland Construction Co., of Omaha, Nebraska. The time was July, 1952. The location, U.S. 14 east of Pierre, S. Dakota. Inland was finishing up a blade mix base and plant mix surface job. Part of the work was to apply a treatment course to turnouts at local road junctions, this operation being done along with oil application for the main roadway base.

These pictures show how the distributor operator made a series of quick, neat switch-backs to cover the turnout, with no hand-application required and a minimum of overlapping.



1 First pass completed around radius at right. Machine backed up to begin a curving parallel pass



2 Three passes completed on fanned-out pattern; fourth pass around far radius in progress



3 Fifth pass ending. Job on way to being done in 5 to 10 minutes, and on to the next intersection



4 Now the operator takes a pass across the ends of the previous passes, filling in white corners



5 Power broom used to clear dust from path of traffic along main roadway. Note windrowed gravel for mat construction



The application consisted of 0.4 gal. per sq. yd. of MC-1 asphalt.

The sweeper is making a pass to clean up a path for traffic along the nearest pavement lane. The windrow of gravel at the left is for a base lift.

Turnout oiling is one of the little things that help make a good impression on motorists and farmers. Helps keep local traffic from tracking mud and dust onto the freshly paved main road, making an unsightly condition.

6 A completed turnout at a typical intersection, oiling usually reached back about 30 ft. to the fence line, and took in some shoulder area



Look at the uniform triple-lap coverage and straight edges you get with a "Black-Topper"

You can see the results of Etnyre's exclusive triple-lap coverage (spray from each nozzle overlapping *two* other sprays) in the unretouched photograph above. Road builders have learned that single lap coverage is utterly unsatisfactory . . . double lap coverage somewhat better . . . but triple lap coverage is the complete answer to hitting rough aggregate from all possible angles for complete coverage.

Moreover, by turning the end nozzle as

indicated, you get a sharp line edge which adds the finishing touch to the job. With this accurate alignment, you can spray right up to the edge of curbs. Such dependable operation and uniform, accurate distribution are typical results you can expect from an Etnyre. Investigate today—find out how soon a "Black Topper" can be delivered to you to handle your work faster, better, more economically!

E. D. Etnyre & Co., Oregon, Illinois

SEE YOUR ETNYRE DEALER

ETNYRE
"Black-Topper"
 BITUMINOUS DISTRIBUTORS



Experiences with Asphalt Emulsion

By the City of Dearborn, Michigan

By Harry A. Hoxle

Director of Public Works
Dearborn, Michigan

SOME fourteen years ago the writer had occasion to experiment and construct private driveways with the use of asphalt emulsion, whatever aggregate was in the existing driveway, and such new aggregate as might be necessary to build it to the desired shape and contour. This work showed the possibilities of more extensive use of emulsions in road work, especially the so-called secondary roads and streets, because of the ability to bind aggregate that was damp or wet, thus obviating the customary process of drying out the aggregate before using.

During the past season the City of Dearborn has made extensive use of asphalt emulsions for several different phases of road work. In order to place in operation such a program, the City purchased a Seaman mixer complete with tractor, asphalt pump, and spray bar. The city already had the other needed equipment such as graders, trucks, asphalt distributor, tandem roller and catch-basin educator. (The latter used in lieu of a water sprinkler). After work started, a wobbly roller was purchased to take care of the initial compaction because it was found that the tandem power roller had a tendency to shove the freshly mixed aggregate.

Park Roads

Thorough mixing and compaction of base material is required by this city, which has found emulsions satisfactory for a variety of street, alley and park needs.

Dearborn owns a 522-acre park called Camp Dearborn, about 40 miles from the city. Camp Dearborn has a bathing beach made from Lake Michigan dune sand, three artificial lakes, row boats and pedal boats, and possibly more benches, tables and stoves per acre than any other park in the United States. It provides two weeks' camping for 200 boys and girls, and outings for another 100 children every day as a day camp. On Sunday in 1952 the total attendance of Dearborn residents and their guests all admitted by passes, reached 22,000.

The first improvement in this park was the constructing of asphalt pavements. For these roads, wherever the subgrade was hard and had been in continual use under traffic, it was found that the addition of about three inches depth of road gravel from $\frac{3}{4}$

inch down, plus from $1\frac{1}{2}$ to 2 gallons per square yard of asphalt emulsion, produced a very satisfactory surface that has stood up well through the considerable park-season traffic.

The aggregate was first shaped with the grader to the desired cross section. Just before applying the asphalt emulsion it was found necessary most of the time to thoroughly wet the aggregate in order that the emulsion would not ball up on top. The full amount of emulsion was applied and mixed with the mixer, which pumped from the asphalt distributor driven ahead. Then the aggregate and emulsion were cross-mixed by driving the mixer in a diagonal or weaving path in such a manner as to cover all the surface of the road. This was considered necessary to eliminate lean and fat spots, and to provide a more uniform distribution of the emulsion.

The third mixing, also using the mixer, followed immediately, the machine traveling this time in a straight line. As a rule in about an hour after the third mixing, the emulsion began to break, and was ready for the first rolling with the wobbly. The second rolling with the wobbly followed a few hours later or the next morning. From then on the surface was rolled with a tandem roller once a day for four or five days. All during this time the pavement was open to traffic.

After all of contemplated work had been mixed, the pavement was given a seal-coat with fast breaking emulsion, immediately covered with birdseye gravel, and rolled. The surplus cover material was swept from the road after three or four days, which time allowed the emulsion to thoroughly set. By using this process some 65,000 square yards of roadway was constructed at a cost of approximately \$50,000.

Stabilizing Sand

One stretch of road about 200 feet long consisted of very loose sand. As it was desirable to place an asphalt surface over this area, it was given two applications of two gallons each of emulsified asphalt, mixed in the sand with the Seaman. This stabilized the base sufficiently to allow the trucks to spread the road gravel and for mixing in the usual manner. This stretch of road likewise withstood the summer traffic very well.

One of the points observed was the importance of not applying too much asphalt, as the resulting surface would push and bunch. So care was taken that the ends of the sections

of the work were not over-lapped with emulsion.

If the surface ravelled, because of a deficiency of emulsion, it was corrected by an application of $1\frac{1}{3}$ gallon per square yard of asphalt primer.

The work up and down hill again showed us that too much asphalt was worse than not enough, because the pavement, even after rolling, had a tendency to creep and bunch. A stretch of such road was corrected some two weeks after the first mixing by scarifying with the grader, pulverizing with the mixer, then adding a thin layer of $1\frac{1}{2}$ -inch to $\frac{3}{4}$ -inch crushed stone with a little sand and some dry cement. These materials were re-mixed. The added aggregate "leaned" the mixture sufficiently so that the pavement on the hill remained in good condition for the balance of the year.

Improving Old Macadam

The City of Dearborn has considerable mileage of streets that have never been graded, drained and paved. These streets have served the public for many years with a 3 to 6 inch application of penetration tar and crushed slag. These streets had not had any work done on them for several years, perhaps since they were first constructed, so that the surfaces were badly alligatored, the life of the binding material had decreased to the point that the surfaces were continually full of holes, and had become very rough riding.

To correct this condition those streets that were reasonably smooth were given one seal coat of emulsified asphalt and crushed slag graded from $\frac{1}{4}$ inch down, so that the fines would penetrate the alligatored cracks to make a water-tight surface. The surfaces were then rolled, and after two or three days surplus cover material was removed with street sweepers. This material, after drying out, became quite dusty, so that it was necessary to sprinkle daily to keep the dust down. This did not seem to slow the setting of the seal-coat emulsion. If time had permitted, a double seal-coat would have been still better.

Streets in bad condition were first scarified with a heavy grader, which resulted in some considerable sized chunks. Some of these large pieces were removed by hand, but the remainder were further broken up by one or two mixer passes.

The roads were then shaped with a grader. New $\frac{1}{4}$ -inch-minus crushed slag was added to fill the voids, using

Handling Bitumens? Want to Cut Costs?



FOR HEATING asphaltic materials faster, and for any job where steam is needed, you can't beat this Bros steamer. It's portable, compact, weatherproof. It has the best possible boiler design for an uninterrupted supply of steam at high ratings. Its working controls are so simple anyone can operate it. Requires only routine blow-downs because it is self-cleaning. No water treatment necessary. Three sizes available. Make steam the best way—the Bros way!



FOR SPREADING with greatest control at lowest cost, here's your answer! Take a look—the gingerbread is gone. No complicated gadgets or congested piping—this new streamlined Bros unit sets a new standard of distributor design. Its amazing heating action comes from a tremendous heating surface area. Operators say the working end is so easy to operate that they can spread better and faster than ever before!

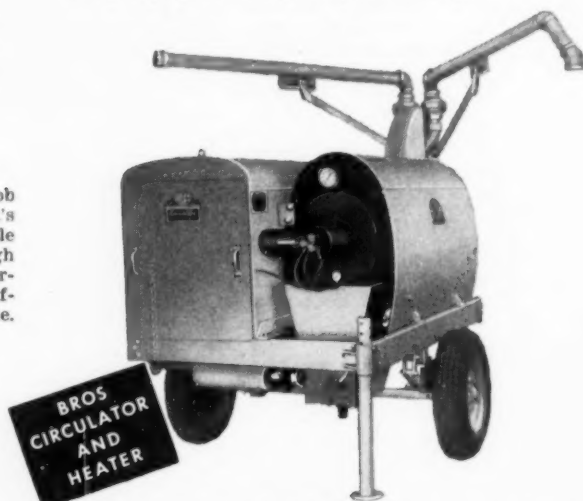
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WM. BROS BOILER & MFG. CO.

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One of the best answers to high operating costs these days is *better equipment* . . . equipment that works fast . . . with highest possible efficiency . . . and that stands up day after day under all kinds of operating conditions. For the handling of bitumens, these Bros units are terrific. They've got new, exclusive design features . . . they're simple . . . and they're built with extra muscle and strength for long life. They'll pay their way on your next job!



FOR PUMPING and HEATING bitumens in spots where steam is not needed, this Bros unit will earn your praise in short order. It has an exclusive 2-way heating feature for faster and more even heating. A low center of gravity makes roadability a big feature—take it anywhere! Has 4 distinct pumping speeds with widest heat transfer range. Material can be left in unit and re-heated to help start cold tank cars. It's the champ of its class!



THE BROS SPRAYMATIC BAR can show you something new in bar action. It has a new type of positive action nozzle which *cannot* clog. No more streaking or costly second passes. 100% distribution and sharp cut-off at nozzle eliminate suck-back operation.

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Address _____
City _____ State _____



1/30 to 1/20 cubic yards per square yard. Mixing grade emulsion was applied with a distributor and immediately mixed. One gallon was mixed with existing material, after which it rolled down to a very firm surface. With this type of aggregate no advantage could be noticed in the use of the rubber tired roller. After being opened to traffic for several days the surface was given its final treatment, a seal-coat using $\frac{1}{4}$ -inch-minus slag for cover.

Next season for this type of work we will use more asphalt emulsion per square yard, about 1.5 gallons, and a coarser grade of slag to fill the voids.

Alley Entrances

Numerous alleys in the residential districts have never been paved, but through the years have been leveled up with a grader, and crushed slag applied in varying thickness as conditions warranted. These alleys as they approach intersecting streets have caused considerable complaints from sidewalk users as there were no crosswalks.

Time has not permitted complete reworking of alley surfaces, but alleys have been improved by mixing and reshaping, working from the street quarter-line back about 50 feet, taking in the alley entrance, the crosswalk and an additional 25 feet.

These so-called alley approaches were probably more expensive per square yard to construct, than if the entire alley could have been worked at the same time, but the result was a very desirable crossing for pedestrians, and the elimination of ruts. It is hoped that in another season many of these alleys can be mixed their entire length, to save maintenance costs.

The use of mixed cold-patch material was eliminated during the summer months, and all holes in old concrete pavement or slag roads were patched by pouring asphalt emulsion of mixing grade, then adding enough $\frac{1}{2}$ -inch slag to fill the hole and absorb the emulsion.

In conclusion asphalt emulsion has lived up to our expectations. Some mistakes were made, as the entire personnel had to be trained in its use and possibilities. The following general principles have guided our work:

1. The sub-grade must be hard, with no soft or spongy places.
2. In rejuvenating old crushed slag streets to be sure that enough fines are added to fill the voids and make a dense mixture.
3. Better to use not enough emulsion than to use too much.

Next season should show a continued improvement in the quality and durability of the work to be done.

Wood of Autocar Car Retires. After serving for 32 years as advertising manager of the Autocar Co., Ardmore, Pa., Robert F. Wood has retired. He is succeeded by T. J. Delaney.

Revised taxiways design

The capacity of many airports is often limited by the speed with which incoming planes can clear the runways. As a means of increasing capacity, the U. S. Civil Aeronautics Administration has recently been studying designs of lead-off taxiways which would permit planes to leave a runway quicker. Basic to such designs is a knowledge of how sharply various planes can actually turn on the ground. This has been studied by the ITTE, and some tentative design standards have been proposed.

The study has consisted of observing the paths of DC-3, Convair-340, and DC-6 aircraft when making the sharpest turns which the pilots thought practicable at various speeds. The turns were made on a grid of 20-ft. squares, painted on one of the runways at San Francisco Airport. A movie camera on the plane was used to photograph the grid as the plane moved over it. From these photographs, the speed and path of the plane were reconstructed.

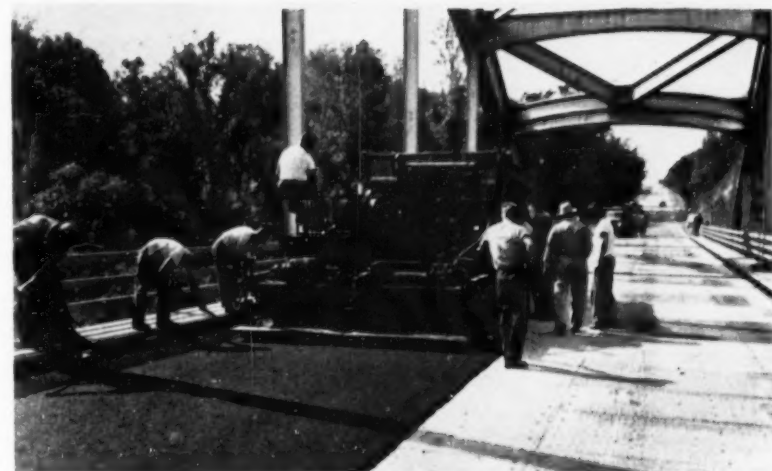
It was found, as a practical matter, that sharpness of turn is limited by

chattering in the landing gear, assumed to be indicative of impending skid.

The test turns were made at speeds ranging from 18 to 50 mph. The minimum radii ranged from 90 ft. at the lowest speed to 560 ft. at the highest. The suggested design radii are 50 ft. for 10 mph., 350 ft. for 30 mph., and 1,000 ft. for 50 mph., applicable to dry bituminous pavement when wind velocity is low. Results of the tests are to be reported in detail at the American Society of Civil Engineers convention in San Francisco, in March.—*Quarterly Bulletin, Institute of Transportation and Traffic Engineering, University of California.*

Indiana: Construction of a proposed 150-mile toll superhighway across northern Indiana may be started by early summer of 1954, according to Chairman James D. Adams of the State Toll Road Commission. Intended to serve as a link in a New York-Chicago chain, the highway will connect on the east with the toll highway now being constructed across northern Ohio. On the west it will reach the Illinois line southwest of Gary.

Experimental pavement placed over grid floor



★ Asphaltic concrete supported on heavy diamond steel mesh was used experimentally to cover over an open steel grid bridge floor, here pictured. Located on the Rock River in north-central Illinois, the 1,000 foot bridge was the scene of accidents due to frequent icing over of the grid floor. As a means of anchoring the mesh, about a thousand annealed steel lugs were welded to the grid using a portable stud welding gun. (United Press Photo)

Protective Seal Coating

(Continued from page 119)

ment remains in good condition, while adjoining pavement of same construction, but unprotected and subjected to only rolling traffic and the sun, shows signs of extensive oxidation and erosion.

In addition to other J-16 sealed pavements of private, corporate, institutional and municipal owners, an inspection report was made of many military installations including U. S. Army General Depot at Memphis, Tennessee; Bergstrom Air Force Base, Austin Texas; Gray Air Force Base, Killeen, Texas; and Fort Bragg, North Carolina. In every case the seal coat was found to have definitely prolonged the life and flexibility of the pavement surface whether from solvent action, lack of life-giving traffic, weathering, or water action.

Inspections showed conclusively that coal tar pitch emulsion seals are most effective and economically sound. It was further determined that

actual experience of engineers in the field does not corroborate the theory that properly designed dense graded hot-mix bituminous pavement requires no seal.

To cite a particular case without revealing the location, an inspection was made of an apron at a large air field which had been designed by the latest known criteria and with strict laboratory control. This was a dense graded hot-mix bituminous pavement with a 2½-in. binder course and a 1½-in. wearing course, and at the time of inspection had been down over three months. Yet when we marked off a square yard area and poured a quart of distilled water thereon, it percolated through the paving course in less than ten seconds. The action of fuel was similar but, of course, much more damaging.

Another interesting observation of the reported survey was the exceptional resistance of a coal tar pitch emulsion to the elements of weather. This was evidenced by the prominent contrast between the oxidized condition of the unprotected bituminous

pavement and the seemingly unweathered condition of the seal coat over the adjoining area of the same pavement. This unusual weatherability was found to be due to the combined performance of two basic ingredients of a tar pitch emulsion; the finely divided mineral content reflects the sun away from the coal tar pitch, which itself has a very low rate of volatilization and, moreover, is impervious to water.

This superior weatherability of coal tar pitch is clearly described in a paper prepared by W. F. Fair, Jr., H. R. Beck, and B. K. McKee of the Mellon Institute of Pittsburgh, Pennsylvania, who have compiled the results of tests titled "Accelerated Weathering of Pitches and Asphalts," read at the annual meeting of the American Society for Testing Materials in 1949.

Moroccan Experience

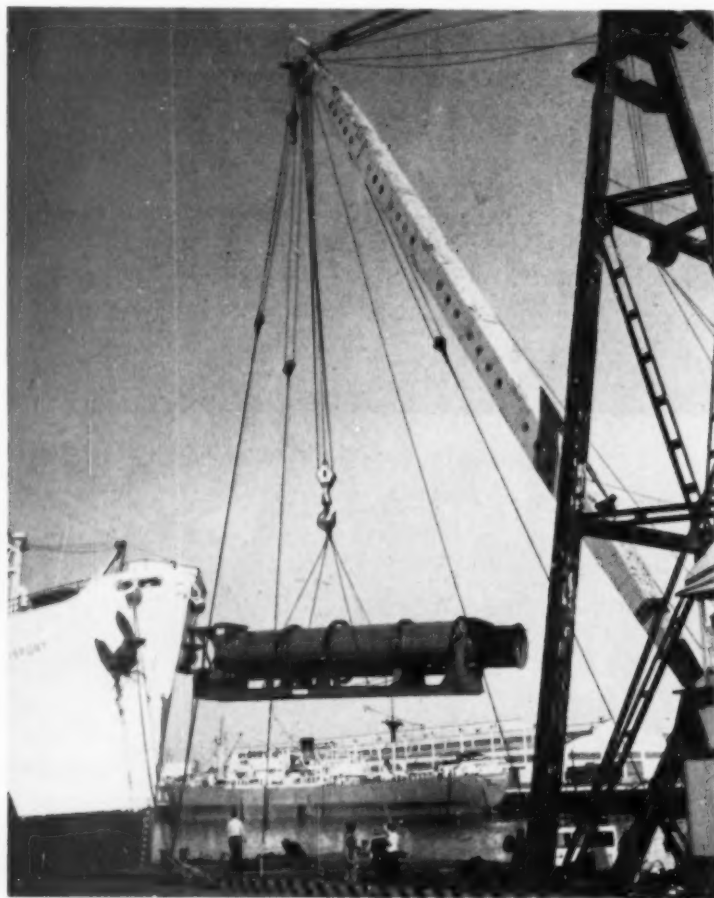
Further research on the use of coal tar pitch emulsion revealed an interesting study on its use overseas. In a paper prepared by A. Mayer, Ingenieur General des Mines (France) this literal translation is taken from an article written for, and published in the January, 1952, issue of "Revue General des Routes et des Aerodromes."

"It was at Nouasseur (Morocco) that the tests were made which led to the adoption of the use of bituminous concrete on the (airfield) parking areas, as well as at the extremities of the landing strips. These tests consisted of spilling of petrol on areas which had been rolled only with, (1) ordinary smooth rollers, (2) with heavy compacting rubber tire rollers, and (3) which had been treated with Emul-tar (a coal tar pitch emulsion.) The same volume of petrol was used on each of the areas."

"In the case of the bituminous concrete rolled in the ordinary way the dissolution of the bitumen was alloyed to a degree; in the case of the bituminous concrete which had been compacted the attack was superficial; in the case of Emul-tar treated surface, it was impossible, even with a knife, to scratch out the top aggregate."

Investigation revealed that Emul-tar in Europe and Jenite J-16 in this country are produced under the same control.

Engineers are in general sometimes slow to adopt new materials or techniques, but this investigation of the use of coal tar pitch emulsion seal coats for the protection of bituminous concrete pavements had definitely shown that this technique has much to offer. It warrants the serious consideration of paving design engineers where protection is needed not only from petroleum distillates, but also elements of weather to which all pavements are subjected.



Asphalt plant being loaded for Bermuda

★ Shown here being swung aboard ship is the large capacity aggregate dryer, part of a Standard Steel asphalt plant destined for an air base paving project on the island of Bermuda. A U.S. Corps of Engineers project; Merritt-Chapman and Scott Corporation, New York City, contractors

P&H**SINGLE PASS STABILIZERS**

P&H Stabilizers are built in 5, 8 and 10-foot processing widths.

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the **P&H** method means to engineers!

Now, soil stabilization has become an *exact science*. The P&H Soil Stabilizer gives you such *complete* quality control every step of the way that you can *pre-determine* load-carrying strength . . . and be sure of it!

In addition, the P&H Stabilizer offers these big advantages to road engineers and builders:

lower material costs!

The P&H Stabilizer makes more effective use of bituminous liquids, cement and water . . . saves on all three counts!

BITUMEN costs lowered! Rapid mixing, before liquids can cool, permits use of heavier grades of cut-back asphalt *than by any other method!* Savings with asphalt two grades heavier exceed \$500 per mile on a 20' roadway at 6" depth!

CEMENT goes further! Accuracy and processing speed obtain maximum benefit of added cement through rapid mixing and compaction. No need for extra cement as with ordinary methods. This P&H advantage alone can save \$500 per mile!

These facts and figures can be proved! If you plan stabilized roads, base courses, airports, of soil-cement, soil-bituminous or clay-gravel, see how it actually costs less, for the better quality you get with the P&H Single Pass Stabilizer. Get Bulletin S-8.

WATER is conserved because complete mixing takes place immediately after full water application, thereby minimizing loss by evaporation.

eliminates need for extra road width!

The extra ½ to 1 foot usually required to compensate for faulty or irregular base edges, is saved. The P&H Stabilizer produces edges of same depth and quality as the rest of the base. This cuts yardage, saves up to \$450 per mile on many jobs.

less personnel

With the P&H Stabilizer, all work is concentrated in a smaller area. Fewer men are needed. Moreover, its greater speed permits faster job completions; limited personnel handles more miles of work per season.

P&H SINGLE PASS STABILIZERS
HARNISCHFEGER CORPORATION
 Milwaukee 46, Wisconsin



10 Ways to Cut Cycle Time

By LeTourneau Field Engineers

SINCE more "yards per hour" is the goal in every earthmoving job, it is essential to realize that cycle time is of basic importance. If the number of yards per load remains constant, cycle time is the variable which controls production.

Let's recall the components which make up cycle time:

- I. Fixed Time
 - a. Load
 - b. Spread
 - c. Turns
 - d. Accelerate, shift
- II. Haul Time
- III. Return Time

In order to lower this cycle time to an irreducible minimum, the following ten pointers are offered as a check list:

1. Plan the job. Lay out the haul roads so that no time is consumed with trick maneuvers. Remember, a straight line is still the shortest distance between two points. Take advantage of the turning ability of the Tournapull. Avoid adverse grades—they can slash production.

2. Space each machine's cycle. Schedule each scraper unit to get into the pit at the right time so that it isn't getting in the way of another rig or holding someone else back. If machines are being push-loaded, synchronize scraper with the pusher.

3. Get loaded fast. This means loading downhill whenever possible. Normally, one minute's time should be sufficient to get a heaped load in a hundred feet or less. Don't spend too much time trying to pack that extra cubic foot of earth on the load—it's poor economy unless the haul is extremely long. When you're loaded, get going!!

Good Haul Road

4. Maintain a good haul road. A hard, smooth road permits the operator to use the speed and roadability of his machine. Traveling in top gear is the fastest way to go. Get rid of ruts and washboard effects with a motor patrol or scraper so that haul speed can be kept high and operator fatigue reduced. If dust is bad, a sprinkler wagon will pay its way by assuring good visibility and a better road surface.

5. Avoid lost time on turns. The operator should make his turns at the shortest angle possible and at the highest speed consistent with safety. Electric power steering makes possible substantial savings of time on turns.

6. Spread in highest possible gear. Of course, the material being handled governs the rate of spread to some extent, but don't lose valuable time inching along the fill letting the load dribble out over an unnecessarily long distance.

7. Leave the fill rapidly. As soon as the load is dumped get back on the haul road as soon as possible. Plan the exit from the fill so as to avoid travel-

ing over soft ground or around obstacles.

8. Don't lug unless necessary. Even though your machine can do it, it's better to shift into a lower gear for the sake of better acceleration. Lugging often results in a lower speed than the top range of the next lower gear.

9. Use preventive maintenance. Don't wait for a machine to break down. Head off trouble and down time with regular check-ups and proper lubrication. Keep close tabs on tire pressure, cables and blades.

Teamwork Pays

10. Play ball with the rest of the crew. Co-operation on an earthmoving job pays off just as it does in any kind of work. The smart operator assumes his share of responsibility for keeping the job going.

While the time saved by the use of any single one of the above pointers may seem small, the total savings obtained when multiplied by many hours and days result in very substantial figures.

For example, let's suppose that through the application of these principles, the cycle time on a certain job was reduced from 7.59 minutes to 6.59 minutes. In a 50-minute hour this would result in an increase of almost exactly one full load. If "C" size Tournapulls were being used, this would mean a production increase of 12.8 pay yards per hour (working in common earth) for each machine; and if there were 3 machines on the job, total production for a ten hour shift would be increased by 384 yards.

Conscientious practice of these ten pointers will soon make them a habit, and consistently high production will be the rule rather than the exception.

P. A. Bradbury Construction Company has fast run

The name of P. A. Bradbury Construction Co., of Aberdeen, South Dakota, was inadvertently omitted from the summary of this firm's U. S. 81 job in S. D., published on page 112, Roads and Streets, January, 1952.

We hasten to give proper credit to this company for the job's rapid execution, involving production and placement of 40,666 tons of asphaltic plant mix in 315 plant operating hours. As previously noted, the job included two-course resurfacing 32 ft. wide. The company's 4,000 lb. plant produced a peak of 1,815 tons in a 10½-hour day.

• New address of the American Road Builders Association is 918 Sixteenth Street, N. W., Washington 6, D. C. Phone Republic 7-5440.



1 Load fast. Push-load downhill whenever possible. Don't overload

2 Keep haul road smooth. Keep it bladed. Keep it sprinkled if dusty

3 Spread in highest possible gear, get off the fill, get on solid ground as quickly as possible

4 Learn quickest, easiest way to make turns—at shortest possible angle

... "the rolls take a beating on this job!"

a report from

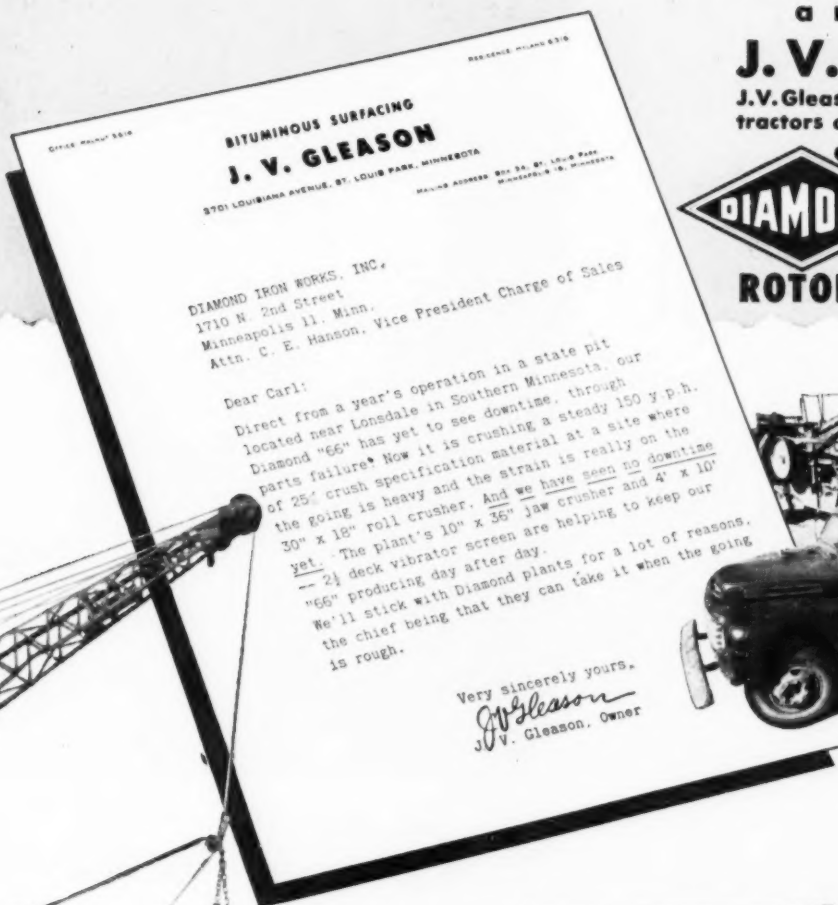
J. V. GLEASON

J.V. Gleason Co., Bituminous Contractors of St. Louis Park, Minn.

on their "66"



ROTOR-LIFT PLANT



ABOVE: Loading pit-run at 150 y.p.h. Power unit installed over delivery conveyor need not be removed when on road.

BELOW: Dumping pit-run into Diamond shovel-loading hopper. A Diamond grizzly and single eccentric plate feeder keep a continuous, regulated feed.



Diamond plants give more output with shorter material flow . . . quicker set-up and knock-down . . . greater all-round portability.

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HOW **DARAKOTE** SAVED WORKING DAYS ON THE NEW JERSEY TURNPIKE

Work on a heavy-traffic expressway like the New Jersey Turnpike can't afford to wait for sunny skies. With the help of DARAKOTE Anti-Stripping Additive, surface treatment of nearly 400 miles of shoulder is nearing completion under the worst possible traffic hazards, in bad weather, and in limited time.

DARAKOTE actually displaces water

on wet aggregates. It makes asphalt stick . . . whether the aggregate or old pavement is wet, damp or dry. It prevents stripping both during and after construction. It extends service life and durability of the pavement. It makes possible wider use of local aggregates in meeting specifications.

For mixed-in-place construction, windrows processed with DARAKOTE-treated liquid asphalts or road oils require about half the time to dry

down to allowable moisture content.

DARAKOTE improves adhesive qualities of asphalt cements, cut-back asphalts, road tars and road oils. Pours readily and disperses quickly in bituminous materials at all working temperatures. Available in ready-to-use form for use in the field, or at the refinery.

WRITE NOW for your copy of "DARAKOTE — the Chemical-Engineered Anti-Stripping Additive"!



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Sand Stabilization Method

Has Varied Applications

HIGHWAY and bridge engineers will be interested in the possible applications of a method of compacting and stabilizing sand wasteland as support for heavy building foundations. The first large industrial plant in the United States to be constructed on sand thus compacted will be completed early in 1953 at Bonnie, Fla., for the International Minerals and Chemical Corp. of Chicago. Rust Engineering Company, of Pittsburgh and Birmingham, are the consultants.

A savings of \$250,000 is said to be achieved by the method which enabled the Bonnie plant to be constructed on dry wasteland with no support other than the sand itself. The entire plant will cost \$12,000,000.

Key to the new practice is a sand compaction process called Vibroflotation which The Rust Engineering Company is franchised to handle by its inventor, Sergey Steuerman, of New York City. The method is said to be adaptable to stabilizing hitherto economically unattractive sand areas such as river basins, shorelines, etc.

The owner faced a foundation problem at this site since its soil must support not only heavy structures but take shock and vibratory conditions without settlement. Soil studies showed the site was underlain with an uncertain base of loose sand, a "sandy matrix stratum," and a third layer of compressible sand and gravelly clay, to a depth of some 60 ft. before reaching a suitable bearing strata.

Rust engineers suggested the use of Vibroflotation for sand compaction, since pilings would be substantially more expensive and might give less stable support. The process was begun after thorough tests and independent reports of soils and engineering authorities confirmed the original recommendation for its use.

The process increases the relative density of sandy soil through a shaking and pushing process that packs the sand grains more closely and tightly together and reduces the voids or empty spaces between the particles.

Centrifugal Force Used

The device used, the Vibroflot, consists of a tube which is vibrated by an electrically driven eccentric inside it. A 10-ton centrifugal force is produced. This apparatus is attached to a follow-up pipe which houses required water and electric lines. In operation the unit is suspended from a crane and guided by vertical wooden leads. Vibrating at full speed, it is lowered into the sand while a water jet at its

tip forms a saturated sand mass or temporary "quick sand" condition, into which the vibrator rapidly sinks.

Lowered to an average depth of 13 ft. at Bonnie, the device by its vibrating action pounded the sand surrounding it into a tighter mass on all sides. Fresh sand was shoveled in from above to fill the extra space emptied by this compaction.

The vibrator was withdrawn in 1-ft. stages, being run at each until the sand was packed as solidly as practical at each stage. An average of 2½ cu. yd. of fresh additional sand was used by the time it was fully withdrawn. The result was a tightly compacted, sand column about 8 to 10 ft. in diameter. The columns were pounded in pre-determined overlapping pattern with about 8 ft. between centers. The pattern greatly strengthens the compaction results which give a relative density of 70 to 100 per cent—more than enough for high or very high bearing capacity.

The complete compaction at Bonnie Plant took two crews 160 days for some 3,350 compactions. Results show, after six months, that one of the first structures completed has experienced no measurable settlement. Advance estimates had allowed for about 1 in. maximum settlement here.

Rust Engineering sees a future for this technique in various types of industrial construction.

Detail of grading specification clarified for Virginia contractors

A bulletin from the Virginia Road Builders Association to its members recently called attention to the following clause in the Virginia road specifications for Station Grading:

"Where the grade line has been shown on the plans, the Contractor will be required to construct the typical section to the grade line shown at the unit price bid for Station Grading." The quantities are not always balanced and it may be necessary to haul excavated material long distances or to secure same from borrow pits. Under the present interpretation of these specifications, the compensation for such embankments, including shoulders, is included in the unit price b'd for station grading."

The furnishing of borrow or the hauling of excavated material for long distances, noted this bulletin, may work a hardship on the contractor unless he has taken this into his calculation of cost. We, therefore, urge you to thoroughly examine the plans and the grade lines shown before bidding on these projects.

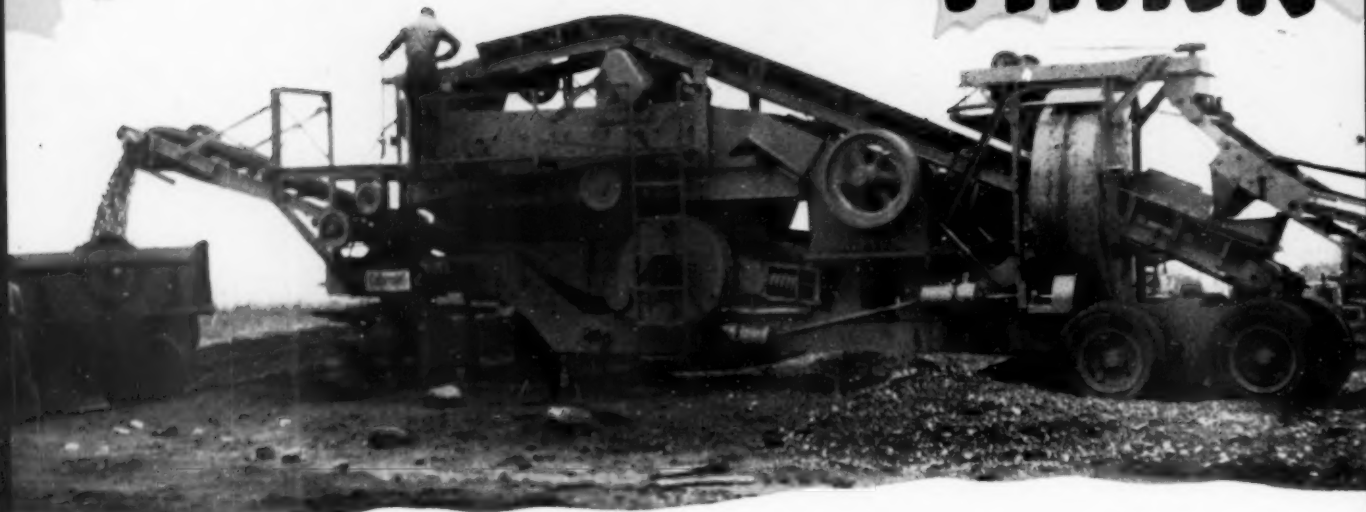
• "Night Visibility." Bulletin 56, Highway Research Board, contains five papers presented at 31st Annual Meeting. Published December, 1952. For copy, address the Highway Research Board, 2101 Constitution Avenue, Washington 25, D. C.

★ Test pit dug through an area compacted by new method. Dark sand indicates original soil; the white sand is the clean sand added during compaction process. Picture clearly shows how the original loose sand is compacted in a horizontal direction and replaced by the clean white sand, which is also compacted in a horizontal direction as the vibrator unit is extracted from the soil. (Note: Jagged and circular holes in sand wall face are the result of test boring and digging)

139



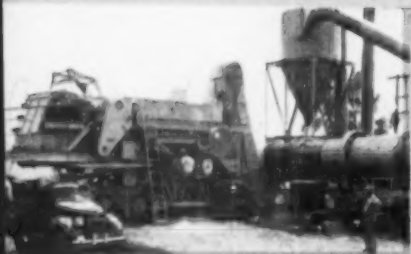
THINK BIG... to meet THINK



THIS CEDARAPIDS COMMANDER PLANT

is doing a whale of a job for Schultz and Lindsay Construction Company on tough crushing and screening jobs in North Dakota. It's no wonder they're enthusiastic about Commander performance. They say they especially like the design ratio of the jaw and roll crushers, screen and conveyors. They also like the high screening capacity and the extreme portability of this compact unit.

THINK CEDARAPIDS . . when you think of bituminous mixing

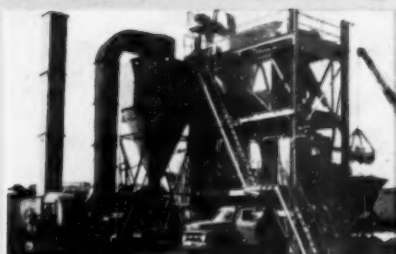


MODEL FA

The most portable batch type bituminous mixer in the Cedarapids line. The FA can be set up for operation in a matter of hours. Centralized controls insure fast, easy, one-man operation. Balanced coordination of every part produces up to 800 tons per day of accurately weighed and uniformly mixed aggregates and bitumen. Quality-built for long-term service at lowest cost.

MASTER PLANT

This two unit continuous-mix plant combines the Cedarapids Master Mixer and Gradation Control Unit to supply specification mix in big volume. The mixing unit is offered with either a twin shaft mixer which conforms to all existing specifications, or a single shaft mixer designed for high speed, vigorous mixing.



MODEL E

Two tons at a batch is average production for this Cedarapids Bituminous Mixing Plant. All-electric operation plus automatic time controls, signal lights and air controls insure absolute accuracy of mix and profitable production for low-bidding contractors.

increasing demands for aggregate

CEDARAPIIDS...

FOR BIG-VOLUME PRODUCTION LIKE THIS—

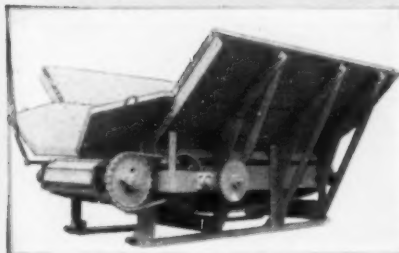
WITH the Cedarapids Commander on your job, you can *Think Big* in terms of exceptionally high tonnage output to meet today's increasing aggregate requirements. If you are a producer who needs greater output of fine-crushed products, or if your pit conditions put a bigger load on the secondary crusher, the Cedarapids Commander is designed specifically for you!

The sizes of the crushing units, screen and conveyors are accurately balanced for maximum production. The big 30" x 22" Roll Crusher steps up secondary crushing capacity to produce greater quantities of smaller size aggregates. The big screening capacity of the 48" x 10' Horizontal Vibrating Screen accurately balances the high percentages of secondary crushing. Conveyors are 30" wide to handle the high hourly output. *And the Commander's operating and maintenance costs remain as low as on other Cedarapids Plants!*

Talk to enthusiastic Commander owners... watch a Commander in operation... your Cedarapids distributor can tell you where there's one working near you, and give you complete details of all the reasons why you'll command the field with a Cedarapids Commander.

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U. S. A.

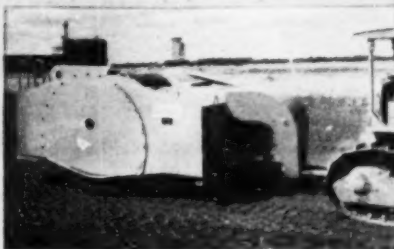


CEDARAPIIDS FEEDERS

Cedarapids Apron Type or Reciprocating Feeders control the feed, prevent choking and provide a smooth, workable flow of material to crushers, conveyors and bucket elevators, eliminating overloads and surges. Available in a wide variety of sizes for all types of aggregate or bituminous mixing plants.

VIBRATORY SOIL COMPACTORS

Here's the way to get maximum compaction on highway subgrades and bases, airport runways, or any soil and graded aggregate construction. Cedarapids Vibratory Compactors, operating on an entirely new principle, provide an impact-compacting action that reaches, and often exceeds, specified densities in one or two coverages, with less labor and lower costs.



420 TONS PER HOUR

on a job crushing $\frac{7}{8}$ " minus wet material containing 19% clay, with 15 to 20% crushing, was average production for this Cedarapids Commander Plant owned by Schultz and Lindsay Construction Company of Fargo, North Dakota.

300 TONS PER HOUR

on $\frac{3}{4}$ " material, with a heavy crush of 40 to 50%, was the Commander's production average on Schultz and Lindsay's crushing job at Garder, N. D.

440 TONS PER HOUR!

Schultz and Lindsay's Commander Plant consistently averages this tonnage on lighter crushing jobs where all conditions are favorable.



MOTORIZED HEAD PULLEYS

Here's a money-saving departure from conventional conveyor drives. With Motorized Head Pulleys, everything is contained inside the drum, completely protected from grit, dirt and weather, with no outside parts or motors to service. 70% to 90% of conveyor trouble and downtime eliminated when you convert your belt conveyor or belt-bucket elevator installations to motorized efficiency!

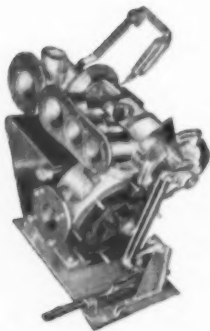
ROSCO'S P. M.*

... Accurate application with the
Rosco BITUMINOUS DISTRIBUTOR

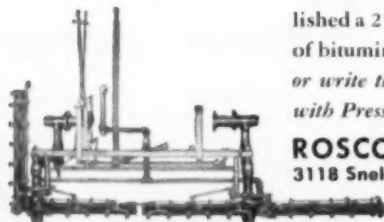


* Pressure Metering PATENTED

permits the operator to use any length of spraybar—from 1 to 24 feet—without changing the pressure and without any application adjustment whatever. This "built-in" control of pressure is the only accurate method of obtaining precise bituminous application.



Cutaway View of the
Rosco 7-Way Master Valve



The Full-Circulating Rosco Spraybar

Application of bitumen is *not* metered by the bituminous pump, nor is the amount of discharge measured in relation to the revolutions of the pump. Normal wear of the pump and occasional, unavoidable nozzle clogging never affect the application rate. The rate is automatically maintained by Rosco's patented P.M. system, an integral part of the Master Valve. It's this valve that also directs the flow of material for all of the Rosco Distributor functions.

Rosco Distributors with P.M. have established a 25 year record for accurate application of bituminous materials. Ask your Rosco dealer, or write the factory for bulletins on Distributors with Pressure Metering.

ROSCO MANUFACTURING CO.
3118 Snelling Avenue • Minneapolis 6, Minn.



WHAT'S NEW

in Equipment
and Materials

(Supplementing the "What's New" section on preceding pages.)

New fork lift truck highly maneuverable

A new model, added to the line of the Truck-Man Division of Knickerbocker Co., has a capacity of 4,000 lb. The unit is highly maneuverable, having a turning radius of only 6 ft. and a speed up to 25



Truck-Man High-Lift Model 40

miles per hour. It has a maximum lift of 106 in. and is mounted on 4 pneumatic tired wheels. Model 40 is equipped with a 4-cylinder Ford 40 HP gasoline engine. The Truck-Man will shortly introduce two other models to complete their line of high-lift trucks—one model to be of 6000 lb. capacity and the other unit to be of 2500 lb. capacity.

For additional information circle Number 69 on inquiry card.

Magnetic sweeper can be pulled, pushed or suspended

A new magnetic road sweeper, designed to remove tacks, nails and other tramp iron from highways, parking lots, factory aisles and airports, has been developed by the Eriez Manufacturing Co. Called the super-sweeper, it can be pushed, pulled or suspended. It is made in four widths: 24-in., 36 in., 48 in., and 60 in. sizes. Entirely new, fast cleaning principles are claimed to make the super-sweeper a natural for



Super-Sweeper

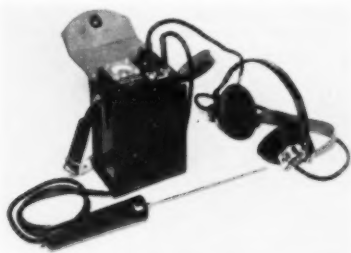
cleaning even the largest areas in a short period of time. The handle is of tubular steel which is easily removed for storage and transportation. The Alnico V magnetic element will snap up and hold tramp iron

which comes in its path. A loop at the end of the steel handle can be attached to almost any trailer hitch. The wheels are fitted with puncture-proof 8.00 in. x 2 in. tires. Heavy-duty models are stated to operate efficiently at speeds up to 10 miles per hour. By removing the wheels and handle, and attaching with built-in eyebolts, the sweeper is quickly adapted for use on industrial lift trucks.

For additional information circle Number 65 on inquiry card.

Maintenance instrument has audio-video features

As a practical help in maintenance, testing and inspection, Anco Instrument Division has introduced a new audio-video model of the Elec-Detec, portable electronic



Elec-Detec Model V

instrument designed for locating noise sources in all types of mechanical equipment. The unit, known as Elec-Detec Model V includes a millimeter for checking sound impulses visually, in addition to the standard headphones for audible operation. The combination, it is stated, enables the operator to "see as well as hear" the location of the source of trouble in bearings, pistons, gears, ratchets, cams, clutches and other moving parts.

For additional information circle Number 56 on inquiry card.

New steel tape in low price range

A new line of 25, 50, 75 and 100 ft. premium steel tapes, stated to sell at approximately half the price previously charged for tapes of corresponding quality,



New Evans Steel Tape

has been announced by Evans & Co., Elizabeth, N. J. The tape is made of 3/8 in. wide high-carbon steel, hardened, tempered and bonderized. It is enameled in white and numbered in black. Markings indicate feet, inches, and eighths. Supplementary feet-markings are given every inch. When worn, blades can be replaced easily. At the end of the tape is a hook-ring combination for one man measurement.

For additional information circle Number 59 on inquiry card.

What Happens-



-when one contractor tells another about the

**STANDARD
RB
ASPHALT PLANT**

Talk about chain reactions! One contractor telling another about Standard's RB Asphalt Plant generally results in a new sale. At least that's how it has been working out in section after section recently. They just *can't* seem to say enough good things about the Standard RB's ruggedness, smooth performance, high capacity and all-around ability to make money.

Take the central New Mexico area, for instance. Less than six months after the first Standard Plant was installed there, 8 more had been ordered inside a 100-mile radius! The same goes for New Jersey, where two orders were placed *within 30 days* after the original Standard Plant went into operation. Yes, the Standard RB has what it takes. Ask the man who owns and operates one.

UNIT BUILT — 8 SIZES, 500 TO 6,000 POUND BATCH CAPACITIES
WRITE TODAY FOR FULL DESCRIPTIVE LITERATURE



STANDARD STEEL CORPORATION

5003 Boyle Ave., Los Angeles 58 • 7 East 42nd St., New York 3

When writing advertisers please mention **ROADS AND STREETS, May, 1953**



O'Hadi Patcher Making Patch in Zero Weather

Road patcher claimed to eliminate hand tamping

A road and street patcher, announced by Buhl Machine Works, Dept. R-S, Buhl, Idaho, is stated to make a good permanent patch in cold, wet weather and therefore can be used throughout the winter. Placed over the break the gas burner heats the hole and mix at the same time. It is stated that hand tamping is not necessary except on large breaks requiring multiple settings.

For additional information circle Number 109 on inquiry card.

Battery has 20% more capacity in same space

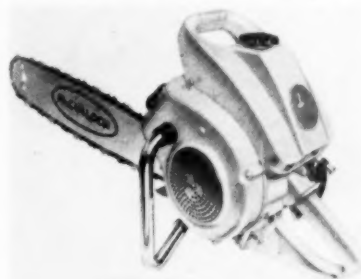
Twenty per cent more capacity in the same space is the advantage claimed for the new line of T-H Exide Ironclad batteries announced by The Electric Storage Battery Co. The new battery, which is essentially the Exide Ironclad using the exclusive slotted tube positive plate, now incorporates new materials and structural changes to give increased capacity. Polyethylene non-oxidizing slotted plastic tubes keep the active material in constant contact

with the grid spines, yet permit free electrolyte penetration throughout the active material. An added feature is the polyethylene acid-proof tube-sealer fitted to the bottom of the positive plate, which seals in the active material and maintains high battery capacity for a longer working life. Grids contain corrosion-resistant Silvium, which also contributes toward longer battery life. Positive plates in this new T-H Exide Ironclad are larger, and are balanced by extra heavy negative plates.

For additional information circle Number 68 on inquiry card.

1-man saw can cut timber up to 5 ft.

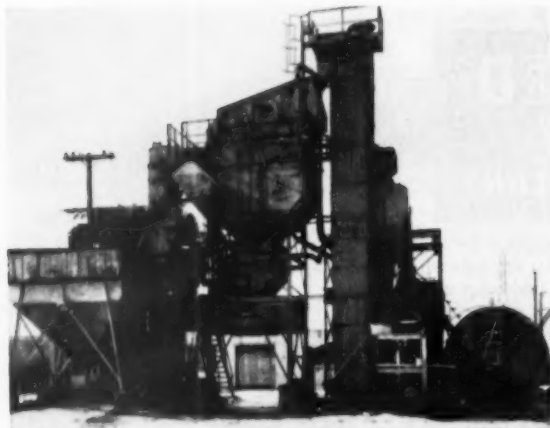
A new, one-man chain saw designed for high-speed cutting in construction and land-clearing work was introduced in April by McCulloch Motors Corporation. This new model 4-30 is stated to have ample power to cut rapidly through timber up to 5 ft.



Model 4-30 Chain Saw

in diameter, yet its light weight and balance make it easy to use and fast for cut-off work in any position. In actual dynamometer tests of the new saws, right off the production line and before breaking-in,

Cummer Asphalt Plants and the World's Busiest Highways Have Grown Up Together



Put Cummer Plants to Work Building Your "Roads to Profit"

The stupendous, unceasing movement of American people and American goods is made possible by twin developments as closely related as two sides of a coin — the vast network of highways and automotive transportation. Cummer, which has been building fine asphalt plants since 1895, has been identified with this amazing growth and expansion from the very beginning.

Typical of dependable Cummer Asphalt Plants — famous for over half a century for profitable production — is the stationary model shown here owned and operated by Asphalt Paving Products Company, Inc., Detroit, Michigan. Designed for efficiency and ruggedly constructed, this Cummer plant consistently produces 80-125 tons per hour (based on 5% initial water content, dried to within 1/2 of 1% and

heated to 350°-400° F.) This complete plant is equipped with dust elevator, washer, enclosed hot elevator. Electrically powered throughout, each unit is individually driven.

Cummer Plants Incorporate These Superior Features:

Mixing towers with vibrating screens and mixer.
Dust collector discharging reclaimed dust into hot elevator.
Two furnace combustion with low pressure burner equipment.

Cold storage bin and feeder.
Enclosed hot elevator.
Diesel or electric power.

CUMMER PLANTS — complete with all motor and starter switches — are available in sizes from 55 to 125 tons per hour. Send for your copy of the descriptive Cummer Catalog today.

THE F. D. CUMMER & SON COMPANY

1827 East 18th Street

Pioneer Builders of Fine Asphalt Plants

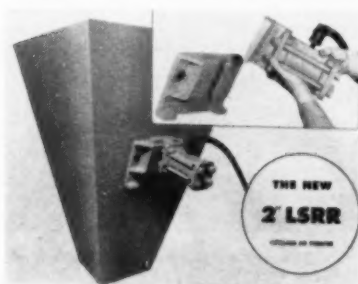
Cleveland 14, Ohio

the factory reports more than four brake horsepower for its new model. The 4-30 weighs 30 lb. complete with a 14 in. chrome-plated blade and chain. Blades available range up to 36 in. in length. A 15 in. bow attachment is also available. An air-craft type carburetor combined with an all-position fuel system enables the Model 4-30 saw to operate at full power in all positions, without carburetor adjustment of any kind. Weight distributed in relation to the blade makes felling, bucking, and limbing, as well as carrying, convenient for the operator.

For additional information circle Number 77 on inquiry card.

New air vibrator eliminates arching in bins

A new 2 in. piston diameter air vibrator, announced by Cleveland Vibrator Co., is claimed to be particularly adapted as a practical means of eliminating arching, bridging and sticking conditions in bins,



LSRR Air Vibrator

hoppers, chutes, flasks, mining cars and other equipment handling granular materials. Principal feature of the unit is its quick, easy portability. The cast steel male bracket on the 2 in. LSRR fits snugly into the female bracket and steps up the unloading of materials having a tendency to pack down. The 2 in. LSRR starts and stops instantaneously and is stated to be ideal on applications where one vibrator can serve several bins.

For additional information circle Number 55 on inquiry card.

New swiveling "headache ball" introduced

New and improved overhauling weights, which include a ball bearing Miller swivel, are now being manufactured by General Machine & Welding Works. The new Miller overhauling weight, or "Headache Ball"

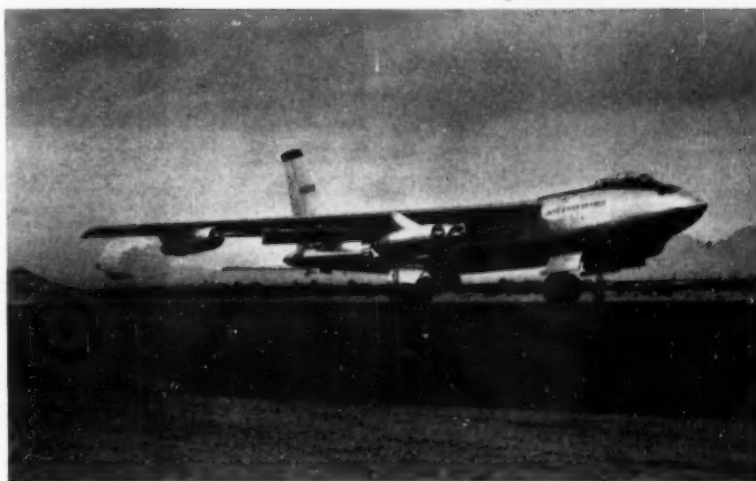


New Miller Overhauling Weight

JENNITE

J-16

Surface Seal



B-47 LANDING ON 12,000 FT. RUNWAY OF GRAND CENTRAL AVIATION CO. — TUCSON, ARIZONA. ENGINEERS — BLANTON & COLE OF TUCSON; GENERAL CONTRACTOR — DEL WEBB — SAN XAVIER OF TUCSON. PAVEMENT SEALING CONTRACTOR — SURFACE PROTECTION CO. OF TUCSON.

MODERN AIRCRAFT REQUIRES MODERN ASPHALT PAVEMENT DESIGN

Such Pavements Sealed With J-16 Provide Greater Service Life Because:

- J-16 keeps them flexible by stopping oxidizing and volatilizing action of the sun.
- J-16 protects them from fuel spillage.
- J-16 eliminates water seepage and resultant frost action.
- J-16, applied without topping aggregate, reduces "pave-ment-flak" hazard.
- J-16 provides a durable easy-to-clean wearing surface.

Protective maintenance pays



For complete details on Jennite J-16—Write for Specifications and these two brochures.



MAINTENANCE INC.

WOOSTER, OHIO

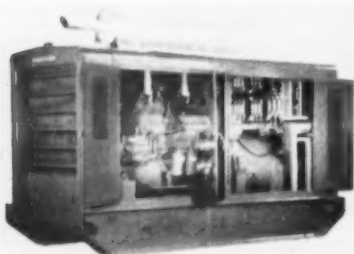
CABLE ADDRESS "MINCO"

as it is popularly called, is often necessary as added weight for single hoisting lines. The Miller angular contact, ball bearing swivel, is stated to provide perfect load control on any weight lifting equipment. The three races of ball bearings insure that Miller swivels always turn freely under the heaviest loading. By swiveling freely, they prevent loads from spinning or getting out of control. In addition, twisting forces on the wire rope are eliminated. Lines are stated to last longer and the danger of their breaking is greatly lessened.

For additional information circle Number 61 on inquiry card.

Engine generator designed for large scale welding

A new type heavy duty diesel-engine generator, designed to improve the efficiency of large-scale arc welding operations for steel fabricating work in the field, has been developed by Ready-Power Co. The 100 KW unit was built specifically for



Model RD24A12 100 KW. Generator

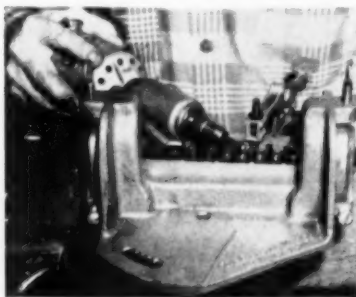
erectors of large-capacity storage tanks for liquid fuel and water. Other applica-

tions for the new generator include bridge building, and salvaging operations, and other steel work in the field requiring multiple welders. The new Ready-Power unit is stated to provide for simultaneous operation of a bank of seven welders. It can also power a 50 H.P. electric air compressor plus a drop-cord line for operation of power tools and emergency lighting.

For additional information circle Number 57 on inquiry card.

Saw sharpener cuts labor cost 75%

A new portable precision power chain saw sharpener, the Sharp-Master, has been



Sharp-Master Chain Saw Sharpener

announced by Meakins-McKinnon, Inc. The unit precision-sharpens all makes of chisel tooth chains to the correct horizontal and vertical angles, cutting teeth to equal lengths. It is claimed to do this in less than 20 minutes, cutting labor costs 75%. Sharp-Master is light weight, quick to set up and easy to operate, right on a chain saw guide bar, requiring no tools. It is

equipped with diamond-hard, high speed carbide burrs, so long-lasting that it is claimed they will sharpen over 100 chains. These carbide burrs can be resharpened, without loss of size, at just a fraction of their original cost.

For additional information circle Number 66 on inquiry card.

New seeder reduces time and hand labor

A new 5-ft. tractor-mounted seeder recently introduced by the Brillion Iron Works, Inc., conditions the seedbed, sows and rolls in a single operation. The conditioning is done by closely spaced pulverizer wheels of the type used in agricultural equipment. The wheels condition the seedbed by breaking up lumps and clods, thus forming a finer mulch on which to sow the seed. In effect, these pulverizer wheels do



Brillion Tractor-Mounted Seeder

the job that usually requires hand labor. The seeding mechanism lays the seed directly behind the pulverizer wheels and is followed by a second roller which covers



at the
ANN ARBOR CONSTRUCTION
Company
ANN ARBOR, MICHIGAN

*"Based On Our Experience
with HOPKINS BURNERS
we've installed Hopkins Units in our 3 other plants"*

If your plant needs an efficient combustion system, consider this message from the Ann Arbor Construction Company. Mr. W. B. Ratliff, Secretary, says—"Our first Hopkins Volcanic Dryer Unit, consisting of three No. 4 Burners, was installed on our No. 4 asphalt plant when it was moved to Roscommon, Michigan, for a 21,000-ton bituminous concrete paving job.

"Based on our experience, using Hopkins Burners on our No. 4 plant, we have installed Hopkins Equipment on each of our three other plants. The four plants have produced over 90,000 tons of bituminous concrete so far this season without any trouble, and without any complaint of moisture in the mix."

You, too, can benefit from Hopkins' efficient, low-cost operation. A letter or phone call will bring you descriptive literature and complete details.

HOPKINS VOLCANIC SPECIALTIES, INC.
ALLIANCE, OHIO

the seed to a $\frac{1}{4}$ in. depth and firms the soil around each seed.

For additional information circle Number 62 on inquiry card.

New 6/12 volt fast battery charger

A new portable 6/12 volt fast charger, announced by King Electric Equipment Co., provides adjustable charging rates up to 80 amperes for six volt batteries, and 40 amperes for twelve volt batteries. The



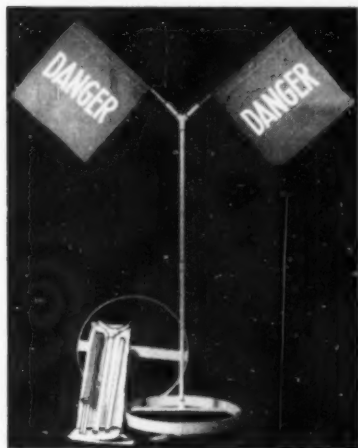
Model BC-57 Charger

charging interval is controlled by a one hour moisture-proof time clock. At the termination of the fast charging period, the charger automatically switches to a slow, or "finishing" charge.

For additional information circle Number 63 on inquiry card.

Standard has flags at drivers' eye level

A new portable flag standard, incorporating design features suggested by "on-the-job" highway workers and repair crews, is now being manufactured by the Charleston Rubber Co. Chief feature of the new McGard flag standard are: Y-type flag

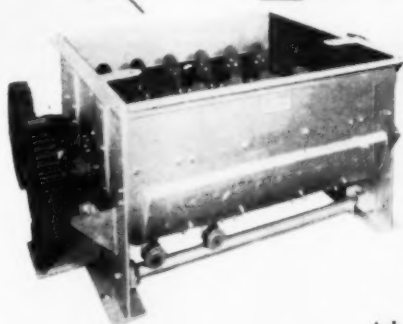


McGard Flag Standard

holder for two red danger flags at eye level to approaching drivers; Upright of standard steel pipe fittings (easily repaired or replaced) with hole for fuse flare; sturdy round base will not tip; If standard is hit, upright shears off at base (avoiding damage to car) and can be re-threaded or replaced; Entire unit, yellow for high visibility; breaks down for packing in

"Deflates" Asphalt Mixing Costs!

IROQUOIS-IMPROVED
EQUIPMENT



With today's high charges for labor and materials, Iroquois—Improved Equipment pays off investment . . . returns profit . . . faster than at any time in history. Let us make recommendations based on study of your operating conditions. No obligation.

Ask IROQUOIS About:

Larger Capacity Mixers • Simplified Drives • High Production Dryers with Automatic Temperature Control • Vibrating Screens • Controlled Aggregate Feeders • Complete Asphalt Plants.



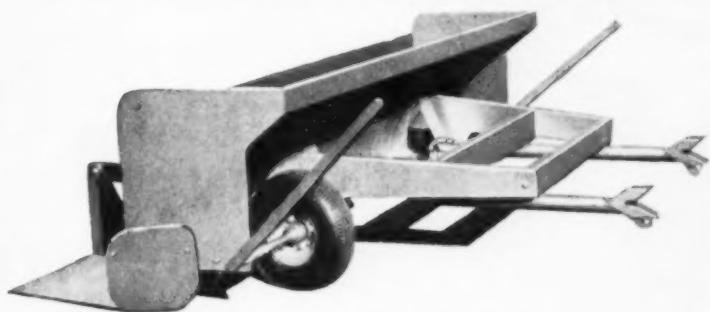
*Iroquois Division**

POSEY IRON WORKS, INC.

**Established over 60 Years*

LANCASTER, PA.—New York Office: Graybar Building

The MILLER Bituminous Concrete and Aggregate Spreader



UNBEATABLE for Driveways, Parking Lots, Light Traffic Roads and Streets. Speeds up all paving jobs—base and top. Self-leveling action on any base contour. Cuts hand labor costs 90%. Spreads $\frac{1}{2}$ " to 8" thickness. Max. capacity 1 ton per min. Highly portable—carried by tail-gate hooks.

Write today for literature and name of nearest dealer.

THE MILLER SPREADER CORP.

120 PIKE STREET

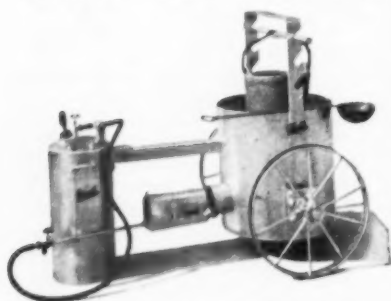
• YOUNGSTOWN 2, OHIO

small canvas bag; can be assembled or taken apart without tools.

For additional information circle Number 64 on inquiry card.

New improved portable lead melting furnace

An improved type of heavy duty portable lead melting furnace, available for quick shipments, has been announced by Aeroll Products Co. It is claimed to be ideal for



Portable Lead Melting Furnace on Steel Wheels

pipe line work or on jobs where the furnace must be moved frequently. Portability on job—even when burner is in operation—creates no problem whatsoever. Users have a choice of either kerosene-fired furnaces or can have them equipped with burner for LPG, Propane, Butane or any of the bottled gases sold now in practically all sections of the country.

For additional information circle Number 72 on inquiry card.

New flow control valve for fork trucks

A new hydraulic flow control valve for fork and straddle trucks is now available from Benton Harbor Engineering Works. Several refinements have been perfected during a 3-year on-the-job test of the valve in industrial use. Sizes are now available for 2,000 lb. to 30,000 lb. fork trucks, and 45,000 lb. straddle trucks. The automatic, self-regulating BHEW flow valve controls the lowering speed of a load in inverse proportion to load weight. The heavier the load, the slower it descends. Of prime importance, particularly when the load is near the truck's rated capacity, is the posi-



BHEW Flow Valve

tive elimination of surge at the start of lowering.

For additional information circle Number 67 on inquiry card.

New portable hydraulic angle iron cutter

A new cutter in their hydraulic Guillotine line, for cutting angle iron, has been announced by Manco Mfg. Co. The new



Model A-20-B Angle Iron Cutter

cutter, according to the manufacturer, cuts with a straight, clean shear and causes no deformation of the angle iron end. The unit is available in portable models with hand-pump hydraulic action for use in field erection work. For production cutting applications, electric hydraulic pumps are available. Capacity of the Guillotine Model A-20-B (see cut) is 3 in. x 3 in. x 1/4 in. or 2 1/2 in. x 2 1/2 in. x 5/16 in. The cutters do not have to be bolted down or otherwise mounted for operation. Adaptations of these units are also available for cutting

Supply Tanks FOR HAULING

HOT OR COLD BITUMINOUS MATERIALS



Semi-Trailer models are made by the famous Littleford Frameless Construction — no trailer frame is needed.



The Littleford Supply Tank transfers its Bituminous Material to the Bituminous Distributor for fast economical spraying.

To keep the Spraying Units on the job the Littleford Supply Tanks haul the Bituminous materials from the source of supply without interruption. These Supply Tanks are the backbone of all road construction and maintenance jobs. Made with or without heating units or transfer pumps, these units speed up the work, are economical to operate and save labor costs. Made in semi-trailer or truck mounted models in sizes ranging from 2000 to 5000 gal. Semi-Trailers are made without the use of a trailer frame known as the "Littleford Frameless Constructed Supply Tank."

Make your next road job a low cost modern undertaking, use modern methods and modern equipment, Littleford Supply Tanks.

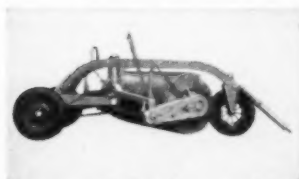


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3 sweeper models, axle, engine or tractor powered.



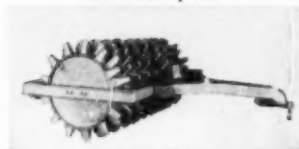
Chip spreaders 8' to 12' width. Also asphaltic concrete spreaders.



Rapid Fire circulating heaters heat and unload large tanks of asphalt.



Rapidspray Maintenance Distributors. Also heaters for production melting of barreled asphalt.



Sheepfoot Rollers
250 to 600 psi.



Pneumatic rollers
7 to 50 tons.

W. E. GRACE MFG. CO.

6007 S. Lamar

Dallas, Texas

special shapes such as channels or H-beams.

For additional information circle Number 71 on inquiry card.

Diamond blade gives 50% more cutting life

A new Target "Super-Rim" diamond blade, claimed to give 50% more cutting life, has been introduced by Robert G. Evans Co. Cutting segments on the rim have been increased a full 50% in depth



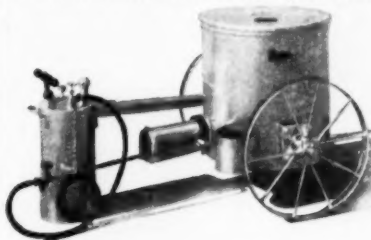
New Target "Super-Rim" Blade

to make possible the increased blade life. No change in the basic formulas have been made except to increase the amounts of diamond and metal powder 50%. As a result, the cutting action of the new "Super-Rim" series will be identical in speed and ease to "Standard" Blade specifications. The blade has a solid steel center and is available in diameters 6 in. to 30 in. Types are available for masonry saws, power hand saws and concrete saws, which have been adapted for "wet" cutting.

For additional information circle Number 74 on inquiry card.

Portable sewer compound melting pots

New improved portable sewer pipe compound melting pots have been placed on the market by Aeroll Products Co., Inc. Illustrated here is an extremely efficient



Portable Compound Melting Pot

type of portable steel-wheeled pot, which, although shown equipped with a kerosene burner outfit, can also be provided equipped with burner for bottled gas. When so furnished the unit would be also fitted up with tubular frame push bar and drop leg. These compound melting pots, according to the manufacturer, are extensively utilized for melting and heating compounds of various types such as Leadite, Hydro-Tite, G-K, Sewer-Seal, Mineral Lead, Gas Main and Water Pipe Coating Enamels, Asphalt, Tar and Pitch.

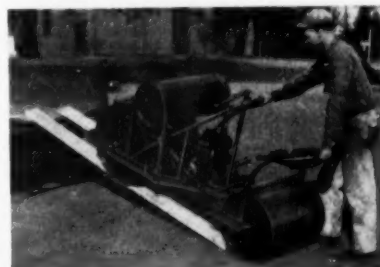
For additional information circle Number 73 on inquiry card.



The 1953 Model CON-SOL All Purpose Power Roller, redesigned for easier handling and greater strength, is the choice of smart contractors for the many smaller jobs for which their standard road rollers are too heavy.



Its weight of 1400 pounds, with both rollers and the 15 gallon sprinkler tank filled with water, is just right for construction of driveways, parking lots, sidewalks and for patching jobs. The sprinkler tank drips water on the rollers to prevent sticking. Powered by a Briggs & Stratton 2½ hp engine, it is economical to operate. Easy to operate, too, because shifting from forward to reverse is controlled by foot levers . . . hands are free to steer and to operate the throttle.



Easily transported from job to job—without loss of time—because it can be carried by a station wagon, pick-up truck or other light conveyance. This means more profitable work done per day, and more income for the contractor.

Let one or more CON-SOL power rollers help increase your 1953 profits. Write today to Dept. B5 for full information and booklet.



CONSOLIDATED INDUSTRIES, INC.
WEST CHESHIRE, CONN., U. S. A.

Trailer drag and windrow eliminator

A new trailer drag and windrow eliminator, announced by Northfield Iron Co., P. O. Box 30, Northfield, Minn., is controlled from grader operator's stand or platform and is adjustable to any contour desired. The trailer drag blade is adjustable to



"Husky" Shouldering Machine

right or left. It is also reversible, top to bottom and end to end, to compensate the wear at end where it rides on pavement. This blade is furnished 8 in. wide in a 9 ft. length usually used for shoulder work, or in an 11 ft. length for road dragging. The customary practice is to let one end of drag blade ride on pavement as a gauge for the work and then set the other end to feather off the windrow as desired. The grader rear wheel should ride on windrow to help pack into the dangerous rut next to pavement. The drag also tends to finish this packing. Also, a 2 ft., special wearing bit to the blade can be supplied at a cost of only \$2.30, which is also reversible, giving four wears and quadrupling the blade life.

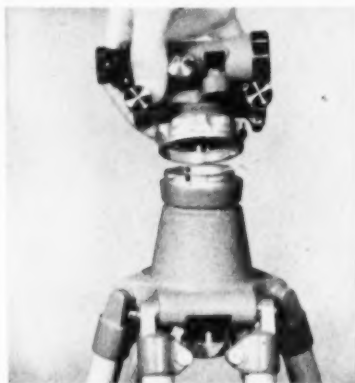
For additional information circle Number 109 on inquiry card.

Swiss optical level has no foot screws

A new Kern GK-1 optical level, announced by Kern Surveying Instrument Division, Paul Reinhart Co., Dept. R-S, 66

Beaver St., New York 4, N. Y., has no foot screws but a ball-and-socket joint instead, which, in conjunction with a bulls-eye level, allows perfect leveling up in a matter of seconds. The Kern GK-1 has the quick-coupling joint shown in the illustration. The operator merely places the instrument on its tripod, gives it a firm twist into place, and the two components become a firm, rigid whole.

After the instrument has been leveled with the bulls-eye device (read through a mirror tilted at a 45-deg. angle), a fine tilt screw is adjusted to bring the telescope into perfect level. Coincidence prisms reflect parallax-free images of opposite ends of the spirit level bubble. When viewed through a 2-power lens near the eyepiece,



Kern GK-1 Optical Level

these appear as quarter circles. Adjustment is continued delicately until they combine to form a semi-circle. At that time

the line-of-sight is guaranteed to be within one second of true level, or 1/3,600 of one degree.

The instruments are made at the Kern factories in Aarau, Switzerland, but are sold and serviced by several representatives in the U. S.

For additional information circle Number 110 on inquiry card.

New pulpwood loader adaptable to many jobs

A new pulpwood loader, manufactured by Hyster Co. is a special tool designed for quick, efficient handling of raw pulpwood



Hyster Pulpwood Loader

or small logs at concentration yards and receiving points. It is also readily adaptable to many other jobs similar to pulpwood handling. The pulpwood loader consists of the Hyster Model 150 lift truck and a special boom attachment. It has a 13,300 lb. loading capacity. The machine has a short turning radius, high degree of maneuverability and an ingenious "split sling" that eliminates hazards in releasing load and speeds up the work.

For additional information circle Number 79 on inquiry card.



OVERMAN'S STONE AND BITUMINOUS SPREADER

MAKES MONEY FOR YOU!

... because it saves you money. It's a proven fact that the savings in time and labor with this spreader pays for it very quickly, sometimes on the first job. If you're a paving contractor, get wise, get an OVERMAN SPREADER.

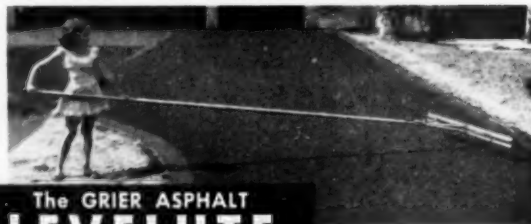
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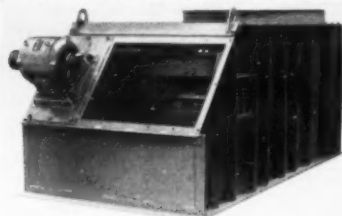
Manufactured and guaranteed by
KAY M. GRIER ENGINEERING CO.
11803 Gilmore Street, North Hollywood, California

Vibrating rod grizzly has high capacity

Production of the "Symons" vibrating rod grizzly, a new high capacity unit designed to scalp in excess of 400 tons of material an hour, is announced by Nordberg Manufacturing Company.

The new grizzly, designed type K-RG, is engineered and built for heavy-duty service in dry, wet, sticky or gummy rock. Extensive tests have substantiated the high capacity of the unit.

Applicable for separations from $\frac{1}{2}$ in. upwards to about 4 in., the "Symons" rod grizzly is ideally suited for service follow-



New "Symons" vibrating rod grizzly with power

ing most sizes of primary crushers and for use ahead of secondary crushers. It serves primarily as a single cut scalping unit. A large feed intake opening and ample clearance between the power unit and the screen deck permits an unobstructed flow of material up to 12 in. feed size.

The vibrator units or power mechanism is basically the same type that has been used successfully on other "Symons" vibrating screens. It is located at the discharge end of the grizzly. Positive vibration is achieved by an unbalanced weight. The vibrator unit has a wide range of amplitude which can be quickly adjusted to meet operating conditions.

The "Symons" vibrating rod grizzly, weighing 7,500 lbs., is 62 in. high at the feed end and 56 in. at the discharge end. It is 12 ft. long and has a width of 68½ in. The unit is furnished complete with V-belt drive and mounts for the 10 hp. motor.

For additional information circle Number 120 on inquiry card.

Wheel lift saves time in changing tires

A new wheel lift that saves time and energy in changing heavy duty tires has been announced by Clark Distributors. It is stated that this tool makes it possible for one man to make a quick change of the heaviest tires on any truck or tractor. This lift is constructed of rugged heavy duty steel yet weighs only 8 lb. A lighter model for automobiles and a rigid heavy duty model for shops are available.

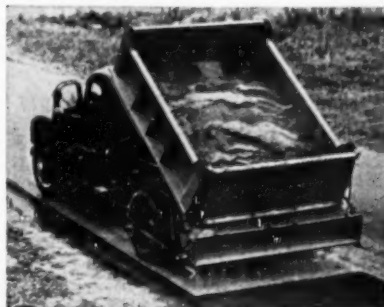
For additional information circle Number 75 on inquiry card.

**Do your sealcoating
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the fast easy Swenson way.
Spreads salt, chloride, sand,
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width or amount desired.**

Free Information

Swenson Spreader & Mfg. Co.

Lindenwood, Illinois



New ½ yd. shovel has many improvements

A new Model S ½ yd. shovel, announced by Little Giant Crane and Shovel, Inc., Des Moines 13, Ia., features a twin dipper stick with powerful cable crowd. Cable crowd drum is readily accessible and easy to maintain. Other features include the patented ball bearing turntable which eliminates rollers and center pin. Main ma-



Little Giant Model S. Power Shovel

chinery deck rotates on 358 steel balls, each 1 in. in diameter. Patented, quick-release, large internal band clutches are another feature.

Shafer self-aligning, sealed cartridge type bearings are now used on all main shafts. All drive gears are cut steel. The Model "S" can be quickly converted to crane, pile driver, magnet, dragline or trench hoe. Also available truck mounted or for mounting on truck supplied by purchaser. Dumping radius is 21 ft., dumping height is 15 ft. 3 in., digging depth below ground level is 3 ft. 6 in. Full 360° swing is 6 r.p.m.

For additional information circle Number 111 on inquiry card.

New rubber-tired bulldozer with 4-wheel drive

New in design but following somewhat their old established ideas of maneuverability, is the recent development of Mixermobile Manufacturers, Inc., their Wagner Dozermobile. It features the unique principle of hinging two power axle elements together by a flexible steering coupling hydraulically controlled. This same coupling allows an oscillating twist to the axles. The rear end steers by a king pin

MAKE ROLLING JOBS PAY

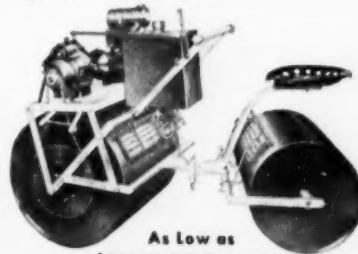
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MOTOROLLER



Motoroller is economical to operate, can be on and off the job in less time than it takes to bring in a big roller, and saves tying up heavy equipment on patching and small rolling jobs. More work per day rolls up profits for you.

Motoroller is versatile, too. Use it as auxiliary equipment to roll out laps left by large equipment and in confined areas of big jobs.

Ideal for driveways, gas stations, parking lots, athletic courts.



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ARE MADE in a complete line of sizes to fit all standard compressed air hammers.

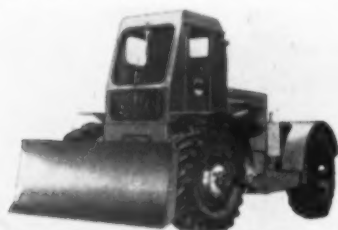
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connection arrangement. Each wheel can move independently over ground obstacles yet remain under positive steering control. All four rubber-tired wheels are under full power at every degree of turn or twist.



New Wagner Dozermobile

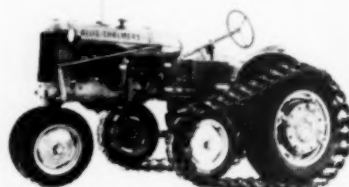
The Dozermobile features planetary drive on all four wheels which largely relieves torque strain on axles and differential through a three-to-one reduction ratio on planetary geared wheel hubs. Complete finger tip hydraulic controls along with the unit's ability to get around from job to job (highway speeds up to 16 mph) are features desired by operators. The operator sits in a cab directly above the Dozermobile blade.

For additional information circle Number 112 on inquiry card.

Converts wheel tractors to crawler type

Half tracks for Allis-Chalmers B and CA tractors and for Case VA, VAC and VA1

tractors have been developed by Arps Corporation, New Holstein, Wis. Two types of half tracks are available: All-steel design and rubber-belted design. In the all-steel



Blackhawk Half-Track on A-C Tractor

Heat Tampers and Smoothers in HAUCK Asphalt Paving Tool Heaters



Combination Asphalt
Paving Tool and
Cement Heater



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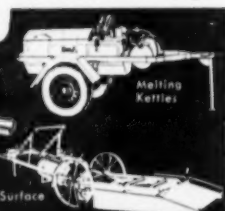
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SOIL COMPACTION. The powerful, new, self-propelling JACKSON COMPACTOR, with 12" to 24" interchangeable bases, achieves specified density of granular soils in 8" to 10" depths at 2400 sq. ft. per hr. Perfect for bridge and pipeline fills, concrete floor sub-bases, etc.

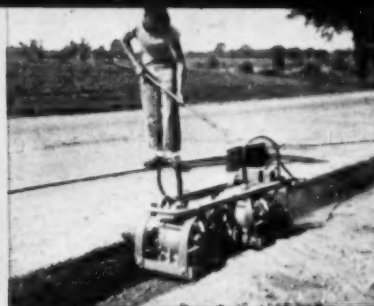
TO BETTER FASTER RESULTS



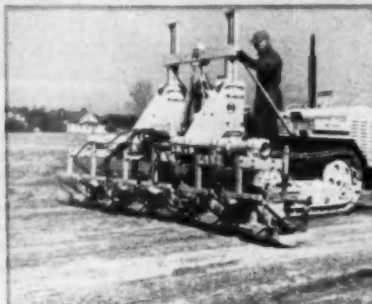
BLACKTOP WIDENING & PATCHING.

The same machine, operated from power plant on auto-trailer with pickup for Compactor, is most efficient means of blacktop pavement widening and patching; paving walks, drives, etc. Compacts 2400 sq. ft. per hr. close to maximum density.

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WIDENING STRIP SUB-BASES. Self-propelling tandem COMPACTOR (12" to 24" wide) will provide specified density in one pass. Controlled by spreader operator. No extra labor required.

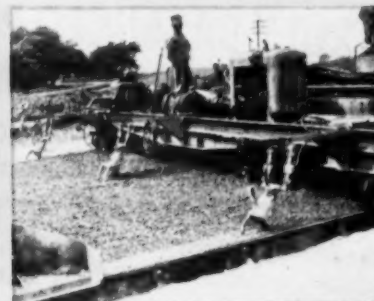


MACADAM DENSIFICATION. Multiple COMPACTOR units, up to 12 ft. wide and tailored to fit job, provide a faster, better means of macadam densification and consolidating sand-gravel-bituminous and other mixed-in-place combinations.



HIGHWAY & AIRPORT PAVING.

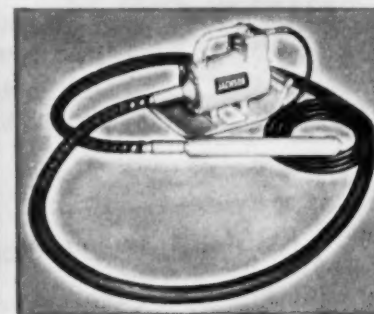
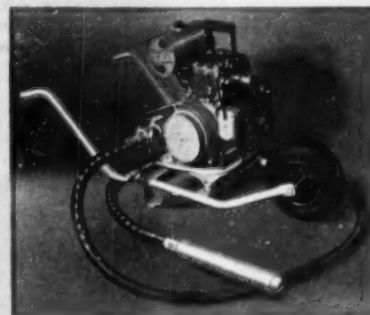
New, super-powered JACKSON PAVING TUBE gives full width internal vibration through full depth of the slab. Saves time, cement; provides greater density and compressive strength. Attaches to standard finisher or spreader.



SIDE FORM VIBRATION. Works equally well mounted ahead of finisher screed or in rear of spreader. Controlled by finisher operator, it saves better part of two men's labor. Will not snag forms or reinforcements, or penetrate into sub-grade.



MUNICIPAL PAVING. This vibratory Screed strikes off to all crowns, undercuts at curb or sideform, works right up to and around obstructions. Only screed that can be rolled back for second passes on 4 rollers. Most productive and convenient screed made.



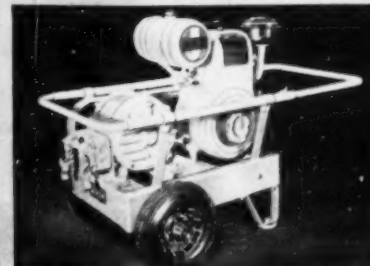
GENERAL CONSTRUCTION

(Left): 6 H.P. engine-driven, flexible shaft vibrator. Excellent for both thin and thick sections. (Right): 2½ H.P. electric vibrator (for light-socket operation). Handy as a pocket in a shirt, powerful enough to handle all general construction concrete vibration with shafts up to 26'.

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JACKSON VIBRATORS Inc.

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DUAL CURRENT PORTABLE POWER

for operating all JACKSON machines and lights. 2.5 to 7.5 KVA, providing both single and 3-phase 60 Cy. 120 V, AC (120/240 V in larger models). Permanent magnet generators require no adjustment or maintenance.



MASS CONSTRUCTION. The JACKSON VS-4 Vibrator has no rival in economically and efficiently placing mass concrete in dams and similar construction.

Mc CARTER ASPHALT PLANTS



TRULY BALANCED PLANTS OF 2000 TO 6000 LB. MIXER CAP.

- McCarter . . . backed by 20 years experience . . . designs and manufactures this equipment in their own works, assuring standardized parts and minimum costs.
- McCarter standard plants are readily adaptable to your special requirements. Individual units are also available.

DRYERS (Hot or hot and cold material, center outlet type)

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Bituminous Spreader



It lays asphaltic mats comparable to the most expensive machines—but at a fraction of the initial and operating costs. Simplified construction and operation makes it possible. The BURCH can be used with any dump truck without special attaching equipment.

Complete and independent adjustments of feed gate and strike-off blade are provided which—together with flexible hitch and long wheel base—assure a uniform mat under all conditions. Front steering wheels permit guiding the machine accurately and easily. Write for literature today.

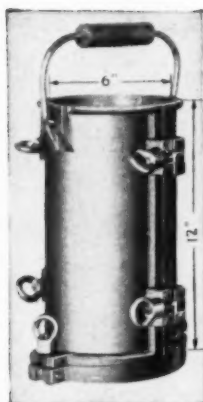
BURCH FORCE-FEED CHIP SPREADER

BURCH dual feed control assures positive and accurate feed over the roll. It's easy to get the exact amount of material required to meet any specification. Flow starts and stops instantly with motion of feed roll. There are no blank spots, no dribbling, no excess material to be raked out. The BURCH Chip Spreader lays a stone mat equally well with the machine moving forward or backward.



For complete information write Dept. R-53

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MANUFACTURERS OF EQUIPMENT FOR CONSTRUCTION
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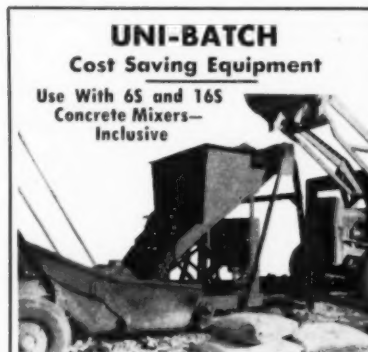
CONCRETE TEST CYLINDER MOLDS

You can produce accurate test specimens to exact measurements with Moline Molds. They meet all ASTM requirements and are virtually indestructible—because they are made of refined malleable iron. Portable for laboratory or field work. Various sizes available including standard 6" x 12" Model A (illustrated). Remember—a test is only as good as the specimen.

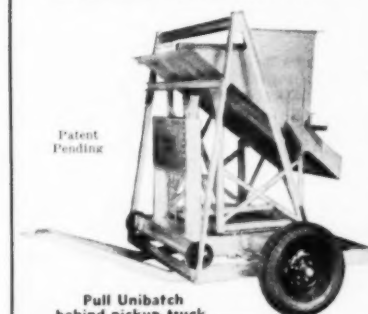
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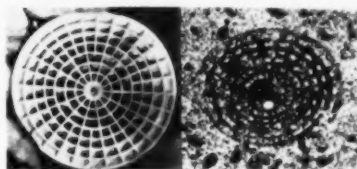
Used in 30 Different States

design connecting links and link straps are case hardened for maximum wear. Two sizes are available 13 in. and 16 in. The half track converts a wheel-type tractor to crawler type within an hour. The track can be removed in 15 minutes. The rubber-belted half track is made of 2 1/4 in. fabric—6-ply rubber belting and is furnished in 16 in. width. The track shoe, as in the all-steel design, is 3/16 in. pressed steel grouser type.

For additional information circle Number 113 on inquiry card.

Plastic traffic markers stand test of time

Plastic Dur-O-Line traffic lane markers were placed on the Lovejoy ramp to Portland's (Ore.) Broadway bridge four and one-half years ago, according to Traffic Safety Supply Co. On recent inspection



Dur-O-Line traffic marker and spot on concrete pavement from which it was removed for inspection

they seemed to be in good shape. One was removed from the concrete pavement and was found to have embedded itself into the concrete which was many years old when the markers were originally installed.

For additional information circle Number 114 on inquiry card.

Redesigned roller has 10 new features

A new model Con-Sol power roller has been announced by Consolidated Industries, Inc., Nixville Road, West Cheshire, Conn. An important new feature is the addition of a foot lever shift for forward and reverse, which leaves the operator's hands free to steer and to operate the throttle. The new speed reducer with gears running in oil in a sealed case is expected to improve operation and increase roller life. Maneuverability is increased by new type linkage between rollers, and bronze bushings, while Alemite fittings at all friction points greatly reduce wear. The parts at points of stress have been strengthened, in

chicago's
PRESTIGE
hotel

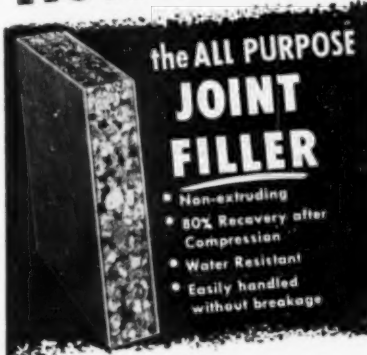
PARK LANE

Overlooking beautiful Lake Michigan—a few minutes to the loop. Rooms and suites... excellent cuisine.

Sheridan Road at Surf Street

CHICAGO

KORK-PAK®



the ALL PURPOSE
JOINT FILLER

- Non-extruding
- 80% Recovery after Compression
- Water Resistant
- Easily handled without breakage

Composed of cork granules bonded together with asphalt between two sheets of heavy asphalt-saturated paper, KORK-PAK is the lowest cost, non-extruding joint filler on the market. KORK-PAK is readily handled without breakage... and when used in conjunction with Para-Plastic Joint Seal, always provides complete joint filling and protection.

Write for details and prices on KORK-PAK. Catalog sent without obligation.

*KORK-PAK is one of the many Patented products developed for the Construction Industry by Serviced Products Corp.

SERVICED PRODUCTS CORP.
6051 W. 65TH ST. • CHICAGO 38, ILL.

IF IT'S WIPERS YOU NEED TRY SOME OF THESE

"WIPEX BRAND" QUALITY WIPING CLOTHS

DOMESTIC WIPERS

- No. 11 **ALL WHITES**—Light-weight, general-purpose wiper; washed and sterilized; minimum size 12 by 12 and over.
- No. 12 **NEAR WHITES**—Pastel colors; light-weight, general-purpose wiper; washed and sterilized; minimum size 12 by 12 and over.
- No. 13 **LIGHT-WEIGHT COLORED**—The same as Near White except darker material.
- No. 14 **MEDIUM-WEIGHT COLORED**—Denim-weight material; cotton sweaters; light-weight pants, etc.; free of heavy seams, pockets, waist bands and other objectionable material; sterilized.
- No. 17 **DOMESTIC WHITE KNITS**—Light-weight underwear; washed, bleached and sterilized; very soft and absorbent, general-purpose wiper.
- No. 19 **RECLAIMED TOWELS**—Turkish and huck; washed, bleached and sterilized; wiper size; durable.
- No. 22 **WHITE COTTON WASTE**—No. 1 quality; free of rayon threads and lint.
- No. 23 **WHITE COTTON WASTE**—No. 2 quality; threads slightly coarser in texture than No. 1 quality.
- No. 24 **COLORED WASTE**—Same specifications as White Cotton Waste, except colored.

ALSO ALL TYPES MILL ENDS

- No. 1 **JUNIOR MILL**—New, washed, bleached and sterilized sheeting from cotton mills; no seams; no holes; free of lint; size from 1/2 to 3/4 yard.
- No. 5 **MISPRINTS**—New, washed and sterilized colored sheeting, misprinted cloth from the mill; free of lint.

We specialize in producing high-quality mill ends. The kinds listed above are produced solely in our own plant and are standard numbers. The quality will not vary more than 2 per cent.

Samples gladly furnished on request. Freight prepaid on shipments of 250 pounds or more.

We guarantee all our wipers to be thoroughly washed and sterilized in our own plant in accordance with all state and city health laws.



INDUSTRIAL WIPING CLOTH COMPANY
P. O. Box 1087
Asheville, North Carolina



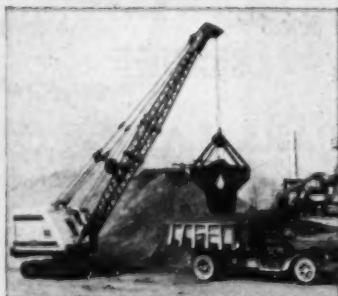
GarWood75

A Heavy-Duty Truck Crane that can Lift up to 20 Tons!

Gar Wood's 75BT truck crane gives you a specially designed, heavy-duty chassis for mobility and speed with full 40,000 lb. lifting capacity . . . Folding boom for easier handling in heavy traffic . . . High gantry, optional fluid coupling to absorb shock loads and power load lowering can't be beat for smooth, precision work! . . . Power actuated mechanical drum clutches, exclusive right angle drive, conical hook rollers and many other operating advantages for faster, easier work . . . The 75BT truck crane is quickly convertible to all attachments including the new, exclusive, profit-making Gar Wood Foundation Borer — the machine that bores and bells in one fast operation . . . Get details from your dealer—

TWO CRAWLER MOUNTED CRANES!

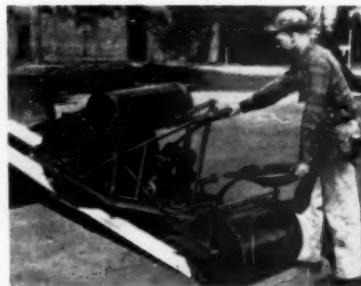
Standard-duty 75A and heavy-duty 75B models. With 35 ft. boom on 12 ft. radius a 75A lifts 16,500 lbs. and a 75B, 21,200 lbs. . . . Both are easily convertible in the field!



P-530

GAR WOOD INDUSTRIES, INC.

Findlay Division • Executive Offices • Wayne, Michigan



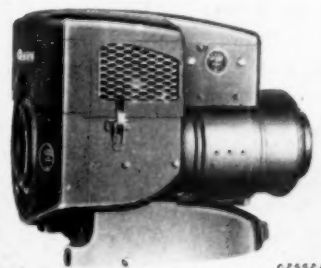
New Con-Sol Power Roller

some cases as much as 50 per cent. Two types are available, the standard model with weight adjustable from 300 to 1200 lb. to suit soil conditions, and the heavier all purpose model with weight adjustable from 375 to 1400 lb.

For additional information circle Number 115 on inquiry card.

Electric generating plant gives increased output

A new 3,500-watt A. C. electric generating plant has been announced by D. W. Onan & Sons, Inc. Conservatively rated, it has a 4,000-watt peak overload capacity for periods of up to two hours' operation. This Model 305CK has been designed to meet the demand for higher capacity in small-sized electric plants. The 115-volt, 60-cycle unit is powered by the Onan "CK" two-cylinder, 4-cycle, air-cooled gasoline engine. A patented engine improvement gives this model an increased rated output of 500 watts over similar Onan "CK"—powered models. Voltage regulator on this new model is plus or minus 3%. Model 305CK is available in manual or remote starting models. Manual plants are equipped with the Onan Read-Full starter, start easily and quickly through



Model 305CK Electric Plant

high-tension magneto ignition. Remote starting units are electrically cranked with the generator acting as the cranking motor. Star-stop stations make starting from remote areas away from the plant possible.

For additional information circle Number 116 on inquiry card.

Joint compound melting furnace uses bottled gas

A new LP gas fired joint compound melting furnace, announced by Hauck Manufacturing Co., Dept. R-S, 124-136 Tenth St., Brooklyn 15, N. Y., is newly engineered and thoroughly field tested. The furnaces are ruggedly built, yet light in weight. Built with enclosed heating burner that conserves fuel and produces any heat, from an extra low turndown to a big fast heat for a large output. No flame impinges on the steel melting pot.

insuring even heating and long pot life. The new furnaces are furnished in both wheel and base mounted models with melting pot capacities ranging from 4 to 25 gal. Advantages claimed for the new furnaces include: bottled gas fuel does



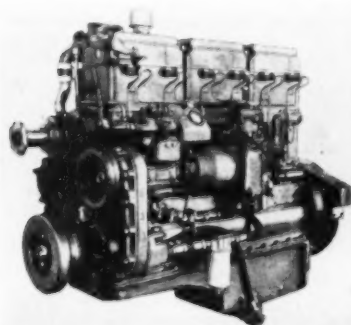
LP Gas Fired Compound Melting Furnace

away with pumping. No delays for pre-heating. No carbon. Just fast, clean, steady heat that is always under the complete control of the operator.

For additional information circle Number 117 on inquiry card.

HP of Cummins Diesel engines increased

In line with the continuous Cummins program to produce diesel engines with a maximum power-to-weight ratio, Cummins Engine Co., Inc., Columbus, Ind., has announced the increase in horsepower rating of the HRBB-600 and HRBBI-600 engines. Power has been increased from 175 to 180 HP at 2000 rpm, with no increase in engine



Automotive Version of Model HRBB-600

weight. The automotive version of this engine model—HRBB-600 is shown in the illustration.

For additional information circle Number 118 on inquiry card.

New catalog on Warco motor grader

A new catalog dealing with the design, construction and performance features of the Warco 4D series motor graders has been announced by W. A. Riddell Corp., Bucyrus, O. The 4D series covered in the catalog are the 4D-85, 85 HP for general duty, and the 4D-100, 100 HP for heavy duty. Many action pictures show the versatility of this grader at work on many kinds of jobs. Text and photographs and diagrams highlight Warco's exclusive features. Text and pictures also explain how the grader blade, entirely cab controlled, can reach every working position without manual adjustment.

For additional information circle Number 119 on inquiry card.



Gar Wood 75

A New 3/4 yd. Shovel with Many Exclusive Features!

Gar Wood has designed the new "75 series" shovels to combine many new and exclusive operating features with time-tested standards of advanced design and rugged construction . . . Both the standard-duty 75A and the heavy-duty 75B have *power actuated mechanical drum clutches, right angle drive, independent chain crowd, power steering, independent travel, conical book rollers* to eliminate rocking and an optional *hydraulic coupling* to absorb shock loads . . . Easy field conversion for crane, clam, dragline, magnet, pile driver or trench hoe work . . . Don't miss checking the profit potentials of the exclusive new Gar Wood Foundation Borer—the machine that bores and bells in one operation . . . See your dealer for details —

EASY CONVERSION IS A FEATURE



Your Gar Wood shovel can be quickly adapted for trench hoe work. Digs up to 17'10" depth, dumps at heights up to 19'3". Standard 40" dipper. 36", 31" and 26" widths optional.

GAR WOOD INDUSTRIES, INC.

Findlay Division • Executive Offices • Wayne, Michigan



F-533

"MEALORUB"

CRUDE NATURAL RUBBER IN CRUMBS

The only natural rubber powder that has proven its value in asphalt roads in use for about fifteen years.

AVAILABLE FOR IMMEDIATE DELIVERY

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New York 5, N. Y.

Representative for Indonesian Government Estates and The Indonesian Institute for Rubber Research

WITH THE MANUFACTURERS & DISTRIBUTORS

Fletcher Appointed Sales Manager. L. R. Fletcher has been appointed sales manager of the Welding Steels Division for the Pyramid Steel Co., Cleveland, O.

Ferriol Named Sales Representative. Stephen L. Ferriol has been appointed sales representative in the northeastern states for W. A. Riddell Corp., Bucyrus, O. His headquarters will be in Westfield, N. J.

Bitucote Moves. Bitucote Products, manufacturers of emulsified asphalt products, has moved to a new and larger plant in Lockland, O., a suburb of Cincinnati, O.

New Warco Distributor. Matcha Machinery Co., Budd Lake, N. J., has been appointed distributor of Warco road graders and Hercules road rollers, of W. A. Riddell Corp., Bucyrus, O.

Wellman Names Sales Manager. Fred B. Shaw, heretofore district manager at Chicago, has been appointed sales manager of the Bucket Department of The Wellman Engineering Co., Cleveland, O.

New Euclid Distributor. Ray-Brooks Machinery Co., Montgomery, Ala., has been appointed distributor in southern half of Alabama for the earthmoving equipment of The Euclid Road Machinery Co., Cleveland, Ohio.

Raybestos-Manhattan Moves Chicago Office. Raybestos-Manhattan, Inc., Passaic, N. J., has moved from 445 Lake Shore Drive into its newly constructed Chicago office and warehouse building at 6010 Northwest Highway.

Tomlinson Appointed Regional Representative. R. H. Tomlinson, West Memphis, Ark., has been appointed regional representative in Kentucky, Alabama, Mississippi, Louisiana and Arkansas for Gallon Allsteel Body Co., Gallon, O.

Ristau Heads Power Tool Sales. E. W. Ristau has been appointed vice president in charge of sales of the Power Tool Division of Rockwell Manufacturing Co., Pittsburgh, Pa. Rockwell's Power Tool Division includes the Delta power tool line, deluxe saw and tool Co., and Rockwell Tools, Inc.

AN AUCTION

TOPEKA, KANSAS, JUNE 1st, 11 A.M. (cst)

A sale of good usable equipment which is in "right ready for the job" condition, sale will be held at 3220 Topeka Avenue at the Martin Tractor Company yard.

Five D-8 Cats all 2U series. 3 D-7 Cats all current series. 2 DW-10's with Cat scrapers, one is 3 years old, one is one and one-half years old. Two #12 Cat 8T series patrols with hyd steering. 4 Scrapers, FP & LP Le Tourneaus, 2 La Plante Choates, 14.3-17.3 yd. and 12-15 yd. Sheepfoot rollers, 105 compressors. Galion patrol, IHC tractors, and many many other pieces. Write or wire auctioneers for complete descriptive catalog. Each Piece Positively Sells To The Highest Bidder Without Limit Or Reservation. This is a complete dispersion sale of the equipment owned by Mr. James Coffey who is retiring. The Martin Tractor Equipment Company of Topeka are also selling a number of large pieces of equipment.

FORKE BROTHERS
the Auctioneers

321 Sharp Bldg. **Lincoln, Nebraska** Phone 2-7045

— EQUIPMENT AUCTION LEADERSHIP SINCE 1921 —

Tractor Bargain

1—RD-8 S N 1H 620 w/LeTourneau cable angle dozer and DDPCU. Just completely overhauled in our shop with all new rollers, new master clutch, engine overhauled, starting engine overhauled. In absolutely A-1 condition throughout \$6,350.00

1—LaPlant-Choate C-84 (13.5-16 Cu. Yd.) Scraper w/4 18:00 x 24 ply tires. S N C84-290. First class condition \$5,550.00

EMMETT C. WATSON CO., INC.
310 East Brandeis St. - CA. 7648
Louisville, Ky.

FOR SALE

Caterpillar D8 Tractor, 2U Series, with Cat 25 DDPCU & LeTourneau Bulldozer \$ 7,000
Caterpillar 12 Grader 8T W/Scarifier, Cab. Electric Starter, Tires \$5,000 7,000
Caterpillar D4 Tractor 7U, with New Hydr. Tractor Hilti, Like New Condition 7,000
Gallon 116 Grader w/ Scarifier, Hydr. Steering, 14.00x24 Tires, Perfect Condition 4,750
Caterpillar 112 Grader, 3U Series 4,500
Caterpillar 70 Scraper, Like New 6,250
Allis-Chalmers HD5G Hilti 1959 4,000
Lorain TL26 Shovel, GM Diesel Power 3,750
Gallon 5 To 8 Ton Tandem Roller 2,659
Caterpillar 50 Gas Sideboom 2,000
Caterpillar 12 Motor Grader 9K 2,350
Gallon 8 To 10 Ton Tandem Roller 2,250
Caterpillar D4 Hilti 1,500
LaPlant Choate C108 Scraper 2,750
LeTourneau M Scraper, 6 To 8 Yard 2,350
International UD24 Power Unit 1,950
New Factory Seconds, each 60.00

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1318 No. Vandeventer Ave.
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CURTA MIDGET CALCULATOR

A GIANT in the palm of your hand



- Easily Operated
- Rotary Action
- Fast, Accurate
- Big Capacity to 99,999,999,999
- Adds, Subtracts
- Multiplies
- Divides, Etc.
- Size 2" dia. x 3"
- Weight 8 oz.
- 3 Check dials
- 1 yr. guarantee
- Lifetime sturdy

Write for full information and offer of no-obligation try-out.

CURTA CALCULATOR AGENCY
925 Hammerschmidt Lombard, Ill.

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DRAGLINE MODEL 3500

80 Ft. Boom, Cat. D-17000 Engine
Price \$37,500.00

ANDERSON EQUIPMENT CO.
Box 21737, Pittsburgh 30, Penna.
Phone: LEhigh 1-6020

FOR SALE

1 Parsons Model 200 trenching machine.

RUFFRIDGE-JOHNSON EQUIPMENT CO., INC.
250 Tenth Ave. S. Minneapolis 15, Minn.
Geneva 0387-0388

USED EQUIPMENT BARGAINS BY MIDWEST

Allis-Chalmers Model D Patrol, with cab, scarifier, lights, 10-foot blade, tandem drive with 7.50x20 tires. Excellent.
Bell Prime Mover Motorized Wheelbarrow with dual pneumatic tires, 10 cubic foot aluminum bucket, splash guards. Excellent.
Essick Model 141 S 6 Cubic Foot Capacity Plaster & Mortar Mixer mounted on 5.50x15 pneumatic tires. Model AKN Wisconsin 4 H.P. air cooled engine. Excellent.
Trench Hoe Attachment (New Style Gosseneck Type) to fit P&H Model 150 Excavator complete with Pettibone Mulliken 31" bucket. A-1 condition. Priced reasonably.
Wallace Model JD 6" Wood Jointer complete with 1/2 H.P. Century Motor. Good condition. Cheap.
Highway Model SKD-2530 12 Ton Semi-Trailer Single Tandem Wheels with 4 (19.00x20) 12 ply tires. hydraulic brakes, clearance lights. Good condition. Cheap.
3—Schramm Model 60 Air Compressors. Good condition. Fair Prices.
Schramm Model 105 Compressor. Excellent. Priced Right.
St. Paul Holst & Body, 2 1/2 Cubic Yard Capacity, Type 454. Good condition. Cheap.
International Harvester Model I-9 Wheel Tractor with Ottawa Hydraulic Front End Loader. Model ID9H. 3/4 Yard Bucket. 7.00x20 10-ply heavy duty front tires, 14.00x32 low pressure heavy duty rear tires. Like new. Fair Price.
Thor Model 25 Paving Breaker. Very Good. Cheap.
Porter Cable Electric Saws & Sanders.

Also in Stock for Immediate Delivery—Compressors, Mixers, DeWalt Saws, Porter-Cable Electric Saws and Sanders, Water Pumps, oil burning Salamanders, Tarpaulins, Steel Scaffolding and Contractors and Builders Supplies of all kinds.

MIDWEST EQUIPMENT COMPANY

501 N. 4th St., Fargo, N. Dak.
Phone — 7541

1400 Main Ave., Bismarck, N. Dak.
Phone — 519

FOR SALE

- 1 International 2 ton, 1948 KBS7 with Littleford M-3, 1000 gal. Distributor.
- 1 Littleford 4000 gal. Asphalt Supply Tank 102 with flues.
- 1 Fruehauf 3800 gal. Asphalt Supply Tank Trailer with flues.
- 1 Littleford 106 Road Boom.
- 1 DS-2 Cleaver Brooks Two Car Heater.
- 1 Bros Steam Generator, 1949—SG 55T.
- 1 Kewanee Firebox Boiler 1930—91314.
- 1 43B Barber-Greene 30 ft. Conveyor.
- 1 Littleford Pump LY 1006 MP, less relief valve B-2-C1, with VE-4 Wisconsin engine & S-42-C1, coupling.
- 1 Centrifugal Rex Pump, 40-M.
- 1 Pettibone Mulliken Speedloader Model 5.
- 1 Onan Generator WC 5 RS.
- 1 Schramm Compressor, with International Diesel Engine, Model 315.
- 1 LeTourneau 3 Tooth Cable Control Rooter, Model S.
- 1 International Crawler Tractor, rebuilt, with Bucyrus-Erie Angle Blade, TD 14.
- 1 Gallion Motor Grader 116.
- 1 Adams Motor Grader, 1947 - 414.
- 1 International 74 in. Wide Gauge Crawler Tractor, with Bucyrus-Erie Angle Blade, TD-18A.
- 1 Bucyrus-Erie S-113 Scraper.
- 1 LeTourneau Roadster, Model "D".
- 1 Triplex Tamper G66.

Also offering Air Hose, Jackhammer, etc.

HINKLE CONTRACTING CO.

P. O. Box 147 - Paris, Kentucky
Phones 1085 and 348

PRICED TO SELL

- 6 Concrete Truck Mixers completely reconditioned and in excellent condition.
- #28, one 1944 Brockway truck, Model 152W mounted with 4 c.y. Rex horizontal mixer.
 - #38, one 1942 Brockway truck, Model 152W mounted with 4 c.y. Rex horizontal mixer.
 - #31—#32—#34, three 1940 Brockway trucks, Model T.M. Spec. each mounted with 4 c.y. Rex horizontal mixers.
 - #4—four Brockway trucks, Model T.M. Spec. each mounted with a 3 1/2 cu. yd. Rex horizontal mixer. All equipment used currently in operation and can be seen at our plant. You can buy these six truck mixers for less than the cost of two new units.

HOWAT CONCRETE CO., INC.
SOUTH CAPITOL AT "S" STREET
WASHINGTON 4, D.C.
Phone: Lincoln 6-5522

FOR SALE

3/4 yard American shovel, with Waukesha gas engine, new 1940 Serial No. G.S. 394. \$6500.00.

1/2 yard American, combination shovel and dragline with 3/4 yard Hendrix perforated drag bucket, Waukesha gas engine new 1938 Serial No. G.S. 362 price \$5250.00.

1/2 yard Model K-12 Insley, 3 way combination with 3/4 yard Hendrix bucket Kohler light plant, new pins in track, new bushings, overhauled motor. 6 cyl. Buda engine \$9300.00.

3/4 yard American Model 375 BC Serial No. G.S. 487 new 1950 with shovel front, a good deal.

4' x 12' Simplicity 2 deck screen with ball tray and several sizes extra screen cloth, excellent condition Serial No. 2412-GP-289F Price: \$1500.00.

8—Model 43 F.D.T. Euclids late models. Excellent condition.

MINNESOTA CONSTRUCTORS EQUIPMENT COMPANY

2518 University Ave. S.E.
Minneapolis, Minnesota
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FOR SALE

Model H3 new Bucyrus-Erie Hydrohoe mounted on new GMC tandem truck. List price \$15,052 F.O.B. Tulsa. Will take \$12,500 F.O.B. Tulsa.

3T series Caterpillar D7 tractor with new crankshaft, pistons, sleeves, bearings, heads, tracks, rollers, sprockets, idlers, transmission and rearend overhauled. With new Caterpillar 7S dozer, double drum cable control. \$13,500 F.O.B. Tulsa.

MCCORMICK MACHINERY COMPANY

Box 3126 - Tele. 8-3307
Tulsa, Oklahoma

GRAVEL PLANT

One 1/2 yd. P&H Shovel, Model #150, Serial No. 5347, new motor just installed.
 One Feeder Charging Hopper, 20 yds. cap.
 One Reciprocating Feeder, 18x30 powered by 5 H.P. Electric Motor.
 One Acme Primary Crusher 18x40 powered by 75 H.P. Electric Motor.
 One 30"x50' Primary conveyor powered by 5 H.P. Electric Motor.
 One 3'x20' Cedar Rapids Washbox powered by 5 H.P. Electric Motor.
 One Acme Reduction Crusher 10x40 powered by 45 H.P. Electric Motor.
 One Acme Revolving Scalper Screen 5x24 powered by 7 1/2 H.P. Electric Motor.
 One Return Conveyor 50' centers, 29" belt, powered by 5 H.P. Electric Motor.
 One Steel Bin used for sand storage, 50 tons capacity.
 One Sand Conveyor 50' centers, 18" belt, powered by 5 H.P. Electric Motor.
 One Long Conveyor 100' centers, 24" belt, powered by 5 H.P. Electric Motor.
 One final rotary grading screen 5' x 24' powered by 5 H.P. Electric Motor.
 One steel and wooden bin, 250 tons cap.
 Power House with one large electric panel and extra starting switches for the large motors.
 One Worthington Centrifugal Pump, 6" intake, 5" discharge, capacity 500 gals. per minute.
 500 ft. 5" water pipe.
 500 ft. 4" water pipe.
 500 ft. 3" water pipe.
 One Siedman 36" Cage Disintegrator powered by 35 H.P. Electric Motor.
 Two dump trucks for plant work (not licensed).
 One Ford Dump Truck, 1944.
 One Michigan Crane, Serial No. T6K3454, 25' boom, 3/4 yd. bucket, powered by Hercules motor.
 One Gould Centrifugal Pump, 4" intake, 3" outlet, powered by 5 H.P. Electric Motor.
 One Good Roads 28 Champion Jaw Crusher, 12x24 (good shape but not in use).
 One Lidgetwood Double Drum Dragline Hoist powered by 60 H.P. Electric Motor. Supposed to be able to handle 1 cu. yd. bucket. This unit is mounted on a heavy truck chassis.
 One T-20 International Bulldozer.

Price Complete \$34,000

The Painted Post Sand & Gravel Co.

PHONE 6-6332
 PAINTED POST, NEW YORK

CRUSHING EQUIPMENT SPECIALS

- 1—22 x 36 Cedar Rapids Roller bearing jaw crusher w/new bearings. A-1 \$6,350.00
- 1—Pioneer 3018 roll crusher. First class condition 2,350.00

The above equipment is owned by us and priced F.O.B. our yards.

EMMETT C. WATSON CO., INC.
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FOR SALE

- (1) Model 1006 Osgood, Serial #5764, 45 ft. boom, 36 ft. sticks, 2 yd. bucket, condition like new.
- (1) Model 1006 Osgood, Serial #5949, 45 ft. boom, 36 ft. sticks, 2 yd. bucket, worked 8 months, condition perfect.
- (1) McCarthy Horizontal Drill, truck mounted, large quantity drill bits and bits included.
- (1) Cleaning Plant and Crusher, 120 tons per hour, can be dismantled and moved. Discontinuing business. Lack of Coal Market

Bellefonte Fuel & Supply Co.
 BELLEFONTE, PA. PHONE 4739

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• **BRODERICK Boiler, Used, 120 HP, 150 lb. working pressure, complete with burner boiler feed pump, injector and pop-off valve.**

• **RAY Burner, Size 11—50168; Type T-6, 7 1/2 HP, 100 lb. steam maximum speed 4000, 230-250 gals. per hr.**

• **RAY Burner, Size 8—50759; Type T-6, 3 HP, 100 lb. steam pressure, maximum speed 4000, 100 gals. per hr.**

• **SIMPLICITY 6' Air Wash. In good shape, with stack.**

ALLIED ASPHALT PAVING CO.

HARRISON & MANNHEIM RDS.

Ph: Linden 4-4947

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FOR SALE

4—Rex Horizontal 2-yd. mixers.
 \$850.00 each.

1—Rex Horizontal 2-yd. mixer mtd. on G.M.C. truck. Mixer and truck \$2,650. Or will sell separately.

3—Jaeger Hydum 2-yd. mixers on G.M.C.'s. New style tail gates. \$350.00 each.

2—Smith 2-yd mixers mounted on K8 tandems, 401 engines. \$5,500 each.

1—Smith 3-yd mixer, mounted on Mack tandem. \$6,500.

1—A-W ten ton 3-wheel roller. \$1,850.

1—1500 watt automatic light plant. \$900.

1—750 watt, 150 volt, 16 cycle light plant. \$500.

1—D8 Ser. IH6034, LeTourneau DDPCU. New bottom rollers, good tracks. \$4,760.00.

1—D4 Traxcavator. S/N 7U-2166. \$3,650.

J. F. BUTLER

1979 Ashland - St. Paul, Minn.
 Midday 9558

FOR SALE or RENT

(WITH OPTION TO PURCHASE)

• **LORAIN 820 Dragline No. 15544 Caterpillar D1300 Engine with 60 ft. Boom, 2 yd. Bucket**

• **LORAIN 820 Dragline No. 17880 Waukesha 8 WAED Engine with 70 ft. Boom, 2 yd. Bucket**

• **CATERPILLAR D-8 Tractor, 8U, Series Front Cable Control Angledozer, Rear Mounted Heavy Hyster Winch**

• **International TD-18 Tractor No. TDR 23056 with Front Control Bucyrus Angledozer and Rear Mounted Double Drum Cable Unit**

All equipment located in Mississippi, with or without 225,000 yards of good drainage work.

EXCEPTIONALLY LOW PRICES

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LAFAYETTE, LOUISIANA

New rock bodies and hoists
 Single and double drum winches
 Single and tandem low bed trailers
 45 ton 24 tire low bed
 Semi trailer dumps and tilt trailers
 Heavy duty tractors and dumps
 1945 Whites 6 x 4 Cummins Diesels

MEYERS TRUCK CO.

Orchard 2-8548, 14th St. Viaduct, Milwaukee, Wis.

FOR SALE

50—1 1/2 yard Blaw Knox, R-46, Bottom Dump Concrete Buckets.

Subject to prior sale

FRAZIER-DAVIS CONSTRUCTION CO.

1319 Macklind Avenue, St. Louis, Mo.

Sterling 1950

Box 153 Grahamsville, New York
 Grahamsville 2861

FOR SALE

1—9 International Wheel Tractor. Tires 18x26 in. Rear Tires like new. Machine in Exc. Cond. Sacrifice \$3000.00.

1—Buckeye Strait Dozer \$500.00.

1—Gar Wood D.D. Control unit \$650.00.

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 MILLER, SOUTH DAKOTA

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229 pss. 80 ft. Carn. M-116-Illinois
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We have Nation-wide reputation for effecting

QUICKEST SHIPMENTS

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509 Locust St., Chestnut 4474, St. Louis, Mo.

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New Buda diesel, model 6BTS-468, engine still in crate, with complete attachments for installation. Buda will supervise your installation and warrant engine. List price of \$3900. We will, for immediate sale, take \$2500. Call us today.

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Truck Shovel & Crane

New 1949

Price \$9,000.00

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1 Rosco 7' power broom

1 Badger 3x8 triple deck vibrator screen

RUFFRIDGE-JOHNSON EQUIPMENT CO., INC.

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Geneva 0387-0388

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Your
Profits!*

28

EQUIPMENT AUCTIONS

SINCE APRIL, 1952

and

ALL SUCCESSFUL!

Here they are

- April 7 Bassett Construction Co.,
Wichita, Kansas
- May 22 James A. Knapp, Contractor,
Beatrice, Nebraska
- May 26 McNabb Coal Co.,
Cataosa, Oklahoma
- June 1 Little Rock Road &
Machinery Co.,
Little Rock, Arkansas
- June 4 J. T. Ryan Estate,
Elkader, Iowa
- June 23 Fargey Construction Co.,
Farson, Wyoming
- June 26 Waterloo Construction Co.,
Freeport, Illinois
- June 30 Don J. Tucker, Contractor,
Wichita, Kansas
- August 4 George Fulton Estate,
Houston, Texas
- August 8 Peters & Doyle,
Lincoln, Nebraska
- August 11 Plains Construction Co.,
North Platte, Nebraska
- August 18 Topeka Excavation Co.,
Topeka, Kansas
- September 1 Stamey Construction Co.,
Davenport, Oklahoma
- September 8 Watkins Contracting Co.,
St. Louis, Missouri
- September 15 Harris Bros., & Son,
Rapid City, South Dakota
- September 22 Marsch Construction Co.,
Boscobel, Wisconsin
- September 24 McGuire Bros., & Hagen,
Tipton, Iowa
- September 29 Frank O. Patterson,
Pittsburgh, Pennsylvania
- November 24 Kirk Construction Co.,
Valley, Nebraska
- February 9 Elam & Son
Winfield, Kansas
- February 24 Milton Reinhardt & Sons,
Russell, Illinois
- March 7 Wagner Johnston,
Sioux City, Iowa
- April 2 Ace Construction Co.,
Omaha, Nebraska
- April 6 A. F. Reis, Contractor,
Topeka, Kansas
- April 17 Clyde Coman & Schultz
Machinery Co.,
Bismarck, North Dakota
- April 18 Withrow Sales & Service
Watertown, South Dakota
- April 20 John W. Whalen
Rockport, Missouri
- May 4 Equipment Dealers of
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3—1035 c.i.m. Ingersoll-Rand Stationary Compressors with 200 H.P. Electric Motors, Air Receivers, Aftercoolers and made-up piping.
10—Ingersoll-Rand No. 229 DJB Drill Booms
16—Ingersoll-Rand DA35, wet type Drifters

For Mucking
3—240 Elmco Rockershovals
4—275 Conway Muckers

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(all 36" gauge)
6—Greensburg, 11 ton, Electric Locomotives
3—Whitcomb, 10 ton, Electric Locomotives
3—40 K.W. Battery Charging Units
2—20 K.W. Battery Charging Units

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8—5 yard Side Dump Muck Cars
6—2 yard Koppel Dump Cars
30—Flat Cars

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2—7300 c.i.m. Roots-Connesville Blowers
1—Joy Axivane Fan, series 1000
12,000"—24" Vent Pipe, Lock Joint, 14 gauge

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2—3/4 yard Hackley Pneumatic Concrete Placers
1—Model 190 Rex Pumpcrete Machine
Special Placing Equipment for Arch and Invert

Miscellaneous
25—1 1/2" to 4" Electric Pumps
2—60 K.W. Diesel Generator Sets

Subject to prior sale

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1319 Macklind Avenue, St. Louis, Mo.
Box 153—Grahamsville, New York

STerling 1950
Grahamsville 2861

FOR SALE

Linkbelt LS85, Ser. 7142 with 40 ft. crane boom and fairlead and dipper stick \$ 6,000.00
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Hough Payloader, Ser. HLA 15053 2,500.00
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2—2" centrifugal pumps rubber tire mounted, each 100.00
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4,000 Gallon trailmobile tank trailer #53118 1,000.00
Aerol sprayer #756P 500.00
5—Littleford Surface heaters, each 300.00
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188 10" Heltzel road forms, Lot 1,000.00
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IHC TANDEM TRUCKS

Equipped with F54 Trans. and 6231 Aux. Trans., Tires 1000x20 front—900x20 rear. Low mileage, very clean.

15—164" W.B. with 8 to 10 yd. St. Paul Dump Bodies.

5—164" W.B. without dumps.

4—157" W.B. without dumps.

OTHER TANDEM TRUCKS

5—1948 IHC KB8F Trucks Tandems 143" W.B., 450 cu. in. engines, air over hydraulic.

International Truck Dealer

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FOR SALE

- 1—Model 32 Bay City Combination Dragline and clamshell, 35 foot Boom. Condition—Good.
- 2—#3 Smithmobile Truck Mixers.
- 4—Model GKA 105 Ingersoll-Rand 2 Wheel Deluxe Air Compressors. Re-conditioned.
- 2—3 yd. Scoopmobile. Reasonable.
- 1—Huber Maintainer. Priced right.

Prices upon Request

R. G. MOELLER COMPANY

KALAMAZOO, MICHIGAN
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FOR SALE

COMPLETE GRADING outfit-D-8, Model 8R with dozer, power control unit, V-type snow plow, LP scraper. All class A condition, ready for work. \$13,500

W-LETOURNEAU new guarantee \$7,000

HOUGH, Model HM, 1 1/2 yd. bucket, snow plow, cab, one year old, \$12,000 unit for \$8,500.

FP-LETOURNEAU, now on the job \$6,300

CHOATE C114, rubber like new \$4,900

BARBER-GREENE, Model 82A bucket loader, worked one day since complete rebuilding job \$4,500

CEDARAPIDS Pitmaster, best used plant we have ever seen, will guarantee \$16,000

SAM TAYLOR EQUIPMENT CO.

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FOR SALE

MACK LJ

1—1947 Mack LJ with 707 engine, 12.00 x 24 tires, 5th wheel, long gooseneck, complete with 1950 Dorsey trailer 25-ton, (8) 10 x 15 tires, tandem axle, F.O.B. Detroit, Michigan.

PRICE.....\$6,500.00

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TIRE SPECIALS

- 12 only 9:00 x 16—10 ply New (Take Offs) Complete with tubes ea. 44.00
4 9:00 x 24—10 ply (Used) Tire, tube and rim. Road grader mud grip—Complete ea. 49.00
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Wheelbarrow type tires, tubes, wheels and bearings and other complete assemblies suitable for machinery trailers (NEW).

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- 1—MODEL 200 SINGLE REX PUMPCRETE MACHINE Capacity 10 c.y. Per Hr.—Self starter and generator—complete with 610' of 8" pipe—less fittings—spare parts. 2400 c.y. since rebuilt.
3—PNEU SKILLSAWS—Late models—like new.

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WANTED:

Floating Gravel Plant
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GUARANTEED USED EQUIPMENT

BACKED BY THE WARRANTY OF A GOOD
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1. Koehring Cruiser Crane—Model 205—half yard capacity with 40' boom — Chrysler gas power — hydraulic steering — one man controls \$12,000.00
2. Caterpillar D-4, Serial 6U2100, Series with Model 4A Hydraulic Angledozer. Excellent condition \$5,200.00
3. Koehring Model 303 ¾ yd. Crawler Shovel & Crane Combination with G.M. 3-371 Diesel Power \$12,500.00
4. Koehring Model W-60 Dumptor 6 yd. Rock Body & G.M. 471 Diesel. Excellent Rubber \$6,000.00
5. Galion Model 118 Diesel Motor Grader Tandem drive powered by UD-16 Diesel Engine, 14.00 x 24 tires front and rear. Fully enclosed cab and scarifier. New in '52 — used only 4 months \$10,000.00
6. Mack Model LSW 10-wheel Tractor powered by Hall-Scott engine, burning either butane gas or gasoline. Unit is factory demonstrator used only 2200 miles \$9,500.00

We can arrange financing for any of these units.

Your own operator can run this equipment in our Philadelphia yard—no obligation—no high pressure.
Just a good warranty from a good house.

FRANTZ EQUIPMENT COMPANY

50th & WYNNEFIELD AVENUE

PHILADELPHIA 31, PA.

GRenwood 7-7200

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- OSGOOD 200 Back Hoe.
CATERPILLAR D4 Hydraulic Dozer, 4R Series.
CATERPILLAR D6 Cable Dozer, 2H Series.
CATERPILLAR D6 LaPlant Choate Hydraulic Angle Dozer, 4R Series.
CATERPILLAR D7 Cable Dozer, 3T Series.
SPRINGFIELD 10 Ton, 3 Wheel Roller.
CATERPILLAR 12 Motor Grader, Scarifier Generator, and Lights.

This equipment is all in good condition.

CENTRAL EXCAVATING CO.

2444-165th Street Phone: Sheffield 5224
HAMMOND, INDIANA

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- 1—Cedar Rapids 9"x36" P.B. jaw crusher; wt. 15,000 lbs. Price \$500.00.
- 1—Eagle Loader mounted on Federal Truck, equipped with conveyor for loading long trucks. Price \$900.00.
- 1—Rock box automatic with revolving screen; 10" suction, 8" discharge. Used 10 days. Less than half price.
- 1—100 K.W., 3 phase, 60 cycle, 220 volt, GE generator on sliding base and coupling. Price \$1000.00.
- 1—6" Hetherington & Berner draught-magnesium roller bearing gravel pump, 300' of 6" pipe and fittings, extra impeller. Price \$1,400.00.
- 1—1742 Buda Diesel with clutch and stub shaft. Price \$300.00.

Will trade all or any of listed items on 8" pump with pipes and fittings.
RALPH PARKIN
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Equipment for Sale

151-M Marion Hi-Lift Electric Shovel, Serial #8566, 48' boom, 36' sticks, 5 cu. yard dipper, General Electric motor, 3 phase, 60 cycle, 2300/4400 volt, A.C. current, Ward-Leonard controls. Purchased new in October 1946. Excellent condition. Located near Lisle, Somerset County, Pa. Price \$100.00

5 W Monigan Dragline Diesel, Ser. No. 649, 110 ft. Boom. Equipped with Fairbanks Morse Diesel Engine for Hoist & Dragline. Cond. Excellent. Located near Somerset County, Pa. Price \$67,500.00

1 Model 618 Page Diesel Dragline, Serial #199, 110' boom, 5 cu. yd. bucket, 3 cylinder Page engine. Purchased new in 1944, good condition. Located near Shanksville, Somerset County, Pa. Price \$55,000

1—3500 Manitowac Hi-Lift 2½ Cu. Yd. Diesel power Shovel, Serial #3513. New 6-cylinder Buda engine, 45' boom, 36' sticks. Equipped with Kohler light plant. Purchased new Nov. 1946. In excellent condition. Can be converted to Dragline. Located four (4) miles East of Somerset, Pa. Price \$35,000

Model 7200 Marion Dragline 5 yd. bucket Fairbanks Morse Diesel Engine for Hoist & Drag, Cummins Diesel Engine for Swing's 135 ft. Boom, Ser. #8840. Fan and all other Electrical Equip. Machine new Oct. 1948. Exc. Cond. Price \$125,000.00

The above equipment is offered on an as is, where is basis, net to us. Price subject to change without notice and subject to prior disposition. Commissions, if any, must be added to the above prices.

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ATTENTION: George E. Seifert

FOR SALE

By Owner—Can Be Seen and Tried on Present Job at Ellsworth, Ohio, on Route 45. Machines can be released to buyer same day.

MARION 111M, Ser. No. 9128, New May 1949, with three Buckets: one 5 yd. Hendrix used 30 days; one 4½ yd. Page heavy duty, used three months; one 5 yd. Hendrix, one year: This machine in A-1 condition \$60,000

MARION 43M, Ser. No. 9427, New Jan. 1951, 22 ft. Boom, 21 ft. Sticks; 1½ yd. Bucket; was only used for coal loading \$22,000

LIMA 1201, Ser. No. 842, High Lift Shovel, with one extra Bucket; in good condition \$20,000

LORAIN 60A, 1 yd. 22 ft. Boom; 18 ft. Sticks; in good condition \$5,000

CATERPILLAR D8, 2U12304, New Oct. 1950, in A-1 condition \$15,500

CATERPILLAR D7, 7M 5326, Cable Blade, with Dble. Drm. P.T.U., in good condition \$4,500

CATERPILLAR D7, 7M 3275, Hydr. Angle Blade, L. C. New Rails and Overhaul \$5,500

INTERNATIONAL TD-18, TDR 16889, New March 1949, Bucyrus Erie Angle Blade; in good condition \$6,000

CHEVROLET Tandem (3), 1950, 2 ton, New Jan. 1950, Four-Wheel Drive, 3-Way Brownie, 2-speed, 7x12 Beds (Ea.) \$2,000

STUDEBAKER 1949, 2½ ton Tandem, Trailing Axle, 7½x13 Dump Bed \$1,500

CHICAGO Pneumatic Compressor, Hammer, Steels and Hoses Complete, in good condition \$1,500

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Evenings—Youngstown 2-1781
CANFIELD, OHIO

FOR SALE

- 23,000' of 3 Conductor 2/0 Steel Taped Parkway Cable, Type RJFI, 3000 V.
 3,500' of 3 Conductor #2 Steel Taped Parkway Cable, Type RJFI, 3000 V.
 2—45 KVA, 2400 V. Primary 480/240 V. Secondary, 3 Phase, Dry Transformers
 2—75 KVA, 2400 V. Primary 480/240 V. Secondary, 3 Phase, Dry Transformers
 5—112½ KVA, 2400 V. Primary 480/240 V. Secondary, 3 Phase, Dry Transformers
 3—100 KVA, 2300 V. Primary 460/230 V. Secondary, Single Phase, Oil Cooled Transformers
 3—50 KVA, 2400 V. Primary 480/240 V. Secondary, Single Phase, Oil Cooled Transformers
 3—100 KVA, 2400 V. Primary 480/240 V. Secondary, Single Phase, Oil Cooled Transformers
 50—Misc. 2, 3, 5 & 15 KVA Single Phase Transformers. Also numerous switches, metal switch cabinets, 50 and 100 amp. cutouts, circuit breakers, etc.

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 Box 153—Grahamsville, New York

STerling 1950
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WILL RENT, SUB-CONTRACT, OR SELL
 THE FOLLOWING EQUIPMENT:

- 1—¾ yd. heavy duty Koehring diesel power dragline, 48' boom.
 - 1—½ yd. Hanson dragline, gasoline.
 - 1—TD-18A 1952 bulldozer, hydraulic.
 - 1—O.C.3 Oliver bulldozer, hydraulic, 1953 model.
 - 1—1952 5 to 8 ton Huber roller.
 - 1—1952 Huber Grader with blade & broom attachments.
 - 1—Gallon Grader, 12-ft. blade, hydraulic.
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 - 1—30 ton low-bed trailer, with 1952 3 ton tractor.
 - 2—1952 Rio tandem 12 yard dump trucks.
 - 2—1952 F-7 Ford dump trucks, 2 speed axle, 5 yard steel bodies.
 - 2—1952 F-6 (big 6 motors) 4½ yard steel bodies.
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 - 1—1951 Ford pick up.
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 - 15 acres good fill land already in operation, best location.
 - 10 acres of 22 2 pit rock (Royalty basis).
- Will rent entire lot of equipment by month under your operation, or under our operation, yardage basis or will sub-contract on full summer work. Or will sell outright including fill and rock pits.

We are qualified for city and county paving and excavating work.

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BUCKEYE LADDER TYPE DITCHER
 MODEL 160

Buda Gasoline Engine

16' max. digging depth—48" max. width

50—Quick change roofer bits

40—Quick change roofer holders

Additional parts included

Used only 100 hrs.—excellent condition

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Complete land lime plant fully equipped for a large daily production, hundred years lime rock supply, located in center of area where there is more lime than anywhere in the country, also a large crushed rock market within truck hauling distance of plant, also a great opportunity for ready-mix concrete; owns its own railroad facilities; nearest land lime competition to this plant 250 miles. Priced very reasonable if sold at once.

Inquire **J. R. CIANCHETTE**

120 Main St., Pittsfield, Maine
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FOR SALE

- 1—1 cu. yd. shovel front attachment for Koehring model 376 dragline—used very little and in first class condition \$1,500.00
 - 1—Jaeger finishing machine #42X000 with extra set rubber tired wheels—adjustable 18' - 25' width—good condition \$4,000.00
 - 1—Flex-Plane joint installing machine #M-112—20' - 25' longitudinal & transverse joints. Machine new in 1951 and used for one mile pavement—almost new condition \$3,500.00
 - 1—1½ cu. yd. Page dragline bucket #4-2649. Used very little and in very good condition \$750.00
 - 1—5-ton Austin-Western Cadet roller, 3 steel wheels #C-2022—good condition \$500.00
 - Atlas Unloader Ser. No. 316216. Equipped with 3 H.P. Elec. motor, 3 phase, operates on 220 volts, 18 ft. Belt. Steel Wheels. Good cond. \$1000.00
- Approximately 3500 lin. ft. 9"x9" road paving forms in fair condition—new stake pockets on many forms—no stakes included—\$1.00 per foot.

Above equipment located at Valdosta, Ga.

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ONE NEARLY NEW 1952 Barber Greene Model 866 Gradation Control Unit, S/N 866-52-29, w/ 4'x8', Simplicity 3½ deck screen, four compartment bin w/calibrated gates over two interlocked apron feeders, semi-trailer mounting, pneumatic tires, air brakes, jacklegs. Screen driven by 880 Hot Elev. Hopper plates, Long Gooseneck and King Pin Adapter, w/Military Extras. List price F.O.B. factory, \$14750.00. Will sell for 10% less list price F.O.B. Mitchell, S. Dak.

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MITCHELL AIR BASE
 MITCHELL, SO. DAKOTA
 PHONE 900

GOOD USED EQUIPMENT

Type 2400 Lima Dragline, with 120' boom, 5½ yd. bucket, Cooper-Bessemer engine. Excellent condition.

1201 Lima Dragline, 85' boom, 3 yd. bucket, Cummins diesel engine. Very good condition.

95 Northwest Dragline, with 90' boom, 2½ yd. bucket, Murphy diesel engine. Late machine.

54-B Bucyrus-Erie Dragline, 80' boom, 2½ yd. bucket, Buda engine, long cats.

37-B Bucyrus-Erie Combination 1½ yd. Shovel & Dragline, with D-13000 Caterpillar engine.

P&H 225-A Straight Front Shovel, with P&H 387C diesel.

34 Lima Paymaster, with 18' boom, 1½ dipper handle, 1 yd. Esco dipper and G. M. diesel engine. Very good mechanical condition.

D-8 Caterpillar Tractor, with cable-operated anglelozer blade; DDFCU.

FRANK SWABB EQUIPMENT CO., INC.

313 Hazleton Nat'l Bank Bldg.
 Hazleton, Pa. Telephone 4910

ROAD FORMS FOR SALE

6000' New Blaw Knox 10x10

3000' Blaw Knox 9x8

8000' Blaw Knox 8x8

2000' Heltzel 9x9

7500' Heltzel 9x8

2600' Heltzel 8x8

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AVAILABLE IMMEDIATELY

1936 MACK BX TRACTOR

CT Engine—BX Transmission—Fifth Overgear—dual reduction rear axle—travels 42 mph—11/22 tires—rear end and motor completely rebuilt January 1952—traveled approximately 20,000 miles since. Make us a reasonable offer.

DURLING FARMS
 WHITEHOUSE STATION, N. J.

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BAY CITY 30, 1/2 Yd. Crawler Hoe Machine, 30" Bucket, Caterpillar Diesel Engine. Serial #5043.

1—Michigan Model C-16 1/2 yd. Crawler with Hoe attachment & Crane & Clam Boom 30 ft. powered by Hercules JXD gasoline engine.

New Bay City Hoe Attachment, complete with 36" Hoe Bucket for Bay City Model 25 or 30, 1/2 Yd.

**SEWARD S. WELLS CO.
132 WELLINGTON ROAD
BUFFALO 16, NEW YORK**

FOR SALE

30,000' used seamless pipe — 12 3/4" O.D.—3/8" wall—51# per foot—in lengths from 17' to 40'—located in Indiana. Priced for immediate sale.

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St. Louis, Missouri
Garfield 2677**

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Barber-Greene travel mixer, capacity one thousand tons per day consists of crawler mounted loader and tandem axle pugmill. Guaranteed for thirty days. Price \$11,000.00 F.O.B. Pueblo, Colo.

**BROWN CONSTRUCTION CO.
1530 E. Abriendo Ave.
Pueblo, Colo.**

L I M A 604 DRAGLINE-CRANE

Equipped with 65' boom, 1 1/2 yd. bucket, long, wide crawlers, D-13000 Caterpillar engine, light plant. Machine 3 years old. Perfect condition. Looks almost like new.

BARGAIN

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313 Hazleton Nat'l Bank Bldg.
Hazleton, Pa. Telephone 4910**

FOR SALE

1945 D4 Caterpillar tractor with Athey overhead loader attachment, half yard bucket, and dozer blade attachment. Very good condition. \$3,300.00.

1942 Austin-Western deisel grader, Model D. S., equipped with V plow, wing plow, and sacrifier. Very good condition. \$3,800.00.

Trojan grader with cab. 12 ft. blade. Model M Serial FBK 164259.

GENE ELY, 701 N. 20th St., Superior, Wis., or call Superior 5170 after 6 P.M.

FOR SALE

3/4 yd. Model 25 NORTHWEST Shovel, Backhoe and Crane combination, D-4600 CAT engine.

3/4 yd. UNIVERSAL Truck Crane with generator set, mounted on Henderson pneumatic tired truck.

Model 392 MARION Hi-front stripping shovel, 1946 machine.

3/4 yd. P & H Model 255-A Shovel, diesel power, 1947 machine.

CATERPILLAR Tractor Model D-6, cable controlled bulldozer.

CATERPILLAR Tractor Model D-7, 3-T Series, Bulldozer, DDPCU Motor and Pony motor, completely rebuilt.

GALION Model 101 Hydraulic controlled grader, new International UD-14 engine, Tires 85% new.

45" Cutter Hammer Magnet.

INTERNATIONAL Tractor, Model TD-24, DD-PCU, completely rebuilt and Bucyrus-Erie Model B-170 Scoop with new Mold Board and Tonque.

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NEW TRANSIT MIX EQUIPMENT

For Complete Portable Plant

This is everything you need

On the job batching 70 yds. per day per truck—All new and ready to go:

4 Yd. CHAMPION Mixer.....	\$3925.00
New GMC Truck	3900.00
20,000# Dial Scale Batcher.....	2450.00
40 ft. Conveyor & Motor for charging Mixer Trucks.....	2350.00
Neptune Water Meter.....	190.00
Front End Loader Tractor.....	2700.00
Price complete FOB Denver.....	\$15,515.00

**1/3 DOWN—24 MOS. ON BALANCE
IMMEDIATE DELIVERY**

Al Willis Sales Co.

**1620 Syracuse St.—Telephone EAst 0726
Denver 8, Colorado**

BARGAINS IN NORTHWESTS

#6 —Dragline #3867—1 1/2 cy bucket, 60' Boom—new #148DK Waukesha engine, (Diesel). \$6,500.00.

#7 —Dragline #3291—1 1/4 cy bucket, 65' Boom—new #148DK Waukesha engine, (Diesel). \$8,000.00.

#80D—Dragline #3896—2 cu. yd. bucket, 75' Boom—Murphy Diesel ME-6. \$9,000.00.

#85 —Dragline #3910—2 cu. yd. bucket, 75' Boom—new 148DK Waukesha Diesel engine. \$10,000.00.

#95 —Dragline #13222—80' Boom & 15' insert—2 1/2 cu. yd. Bucket—#21 Murphy Diesel engine. \$42,000.00.

Model 3500 Manitowoc Speedcrane Dragline 2 1/2 cu. yd. bucket. D-17000 Cat. Diesel Engine, 90 ft. Boom, 1948 machine. \$33,000.00.

54-B Bucyrus-Erie Comb. Dragline & Hilift shovel—2 1/2 cu. yd., 90' drag boom. Sticks & dipper bucket brand new—never used. Buda Diesel Engine —\$47,000.00 1947 model.

1 1/2 cu. yd. Lima Shovel—Waukesha gas engine—good working condition, \$3800.00. Insley 4 1/2 yd. shovel — #K-1260A — K-12, 1947, excellent condition. Chrysler engine. \$5500.00.

All located near Scranton, Penna. All in excellent condition and priced for quick sale.

**B. B. & L. SUPPLY CO.
DUNMORE, PA.
Phone: Scranton 2-2273**

For Sale

Osgood 1 yard combination crane and backhoe — 60' boom. New Buda diesel installed recently — excellent condition throughout—

\$6,000.00

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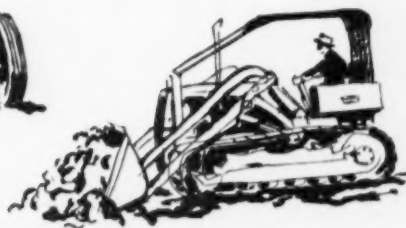
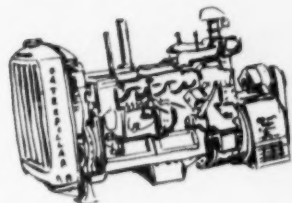
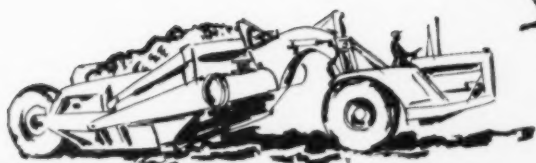
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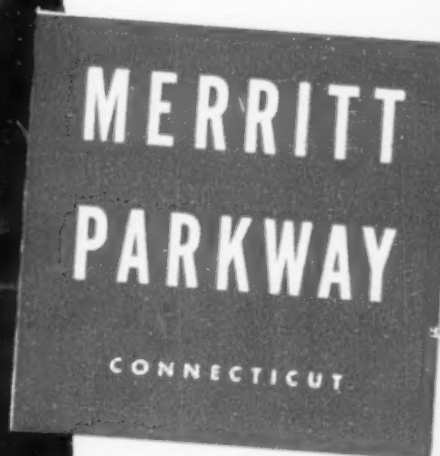
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Above photos show Texaco Asphaltic Concrete, under construction and completed, on another section of the Parkway. The contractor was Cold Mix, Inc., Port Chester, N. Y.

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